

THE MONIST

MENTAL SPACIOUSNESS.

ON the whole, the prevailing opinion in modern philosophy has been that minds are in time but not in space. This belief, to be sure, is held on very different grounds, and it is often denied—again for many reasons. Those who accept it, for example, include M. Bergson who considers space to be illusory and time indefeasibly real, together with the ordinary dualist (and perhaps the ordinary psychologist) who has no doubts about the reality either of time or of space. Those who reject it, on the other hand, include Spinoza who believed that time was only a prop to the imagination although he accepted the full reality of the attribute of extension and completely excluded the attribute of thought from it; and they also include Mr. Bradley and his friends who deny the reality of time and space and, for that matter, of personality itself. It is only in quite recent times, however, that modern philosophers, other than avowed materialists, have maintained, seriously and literally, that minds are spatial as well as temporal.

Now philosophers are accustomed to impute motives to one another, perhaps because manners are relative, perhaps because truth is unmannerly; and so we need not be surprised to find that those who believe that their minds are spatial are apt to twit their opponents with sinister or sentimental designs. The spaciousness of mind, we are told, is the belief of all sensible and unsophisticated men (these adjectives seem to be equivalent for argumentative

purposes); and, consequently, those who deny it are the dupes of their moral prejudices or of their mystical leanings. In a word, they seek a short road to the immortality of the soul by denying to minds, perversely and arbitrarily, the most fundamental property of material things. It would be possible to argue, no doubt, that *even if* minds were unextended, the moral and theological consequences which are frequently drawn from this supposed circumstance are exceedingly disputable in fact. The soul, for example, would not necessarily be immortal (even in the sense of "natural" immortality) simply because it is indivisible; for an indivisible thing might be extinguished although it could not be divided. Moreover, a temporal soul is at least temporally divisible; and Time is the greatest of all dividers. Although these arguments are possible, however, they are less effective than the simple denial that a mind is anything other than a spatial partner in spatial relations. In that case, it is the other party's turn to seek for recondite arguments which inspire but faint conviction. It is possible, to be sure, that a spatial mind might be indivisible and indestructible, since, for aught we can tell, it might be allied with a "spiritual" body (or an aura) in the brain which is impervious to the assaults of gross corruption; but these speculations suggest special pleading.

There is no need to raise these issues, however, or to impute motives. Immortality is not a logical consequence of the immateriality of the soul, and it is not impossible even if the soul were material. As a matter of fact most professing Christians are really Christian materialists, and I do not see why they should not be. They clutch at any straws they can find in the way of physical survival, and they are dissatisfied unless they can find ocular and even photographic evidence of the continuance of a man's wraith. In a word, the speculative belief in the soul's immortality has very little connection with the speculative belief in its

immateriality, and, for the rest, the Christian materialists, if they were frank, could argue their case very easily. If virtue is an excellent thing, virtuous matter, surely, cannot be less excellent. If beauty throbs with deity, so must material beauty. If the universe, transfigured to the eye of faith, is divined to be the bearer of permanent values, it could not bear these values less readily if they were the values of matter. To put the argument otherwise, if only the immaterial can be valuable, then, because there are values, there must certainly be immaterial things. If not, valuable things may be material, and, for that matter, material things may have all the values which Christians discern in the world.

The spaciousness of the mind, however, is simpler and more general than its materiality, and I am asking the reader to consider this simpler problem. Even so, the problem is intricate enough, as recent discussions have shown. A generation ago, the mind's spaciousness would have seemed an intelligible phrase, needing little explanation, and its spaceless existence in time, if a subtler idea, would have seemed readily comprehensible with a very little philosophy. To-day it is different. We are coming, more and more, to put motion, or space-time in the place of space *and* time; and we have come, at long last, to accept Berkeley's distinction of tactual from other spaces with the seriousness which is due to it, both on the part of a physics that is resolutely empirical and on the part of a metaphysics which is enlightened enough to criticize the ready-made speculations of common-sense theory. For these, if for no other, reasons it is becoming immensely more difficult to say with accuracy what must be meant either by a spacious or by a spaceless existence in time.

On the first of these points I shall be brief. We must admit, I think, that the physical world is really a system of motions, a continuum of point-instants in Mr. Alex-

ander's language or an infinite mode of motion-and-rest in Spinoza's. Within this world we elaborate the orders of space and time; and it is likely, for many reasons, that we separate these orders far too sharply in our usual (and, perhaps, even in our scientific) discourse, ascribing to them a fictitious isolation from and independence of one another. On the other hand, we must also admit that these divisions actually exist in nature, and that our beliefs concerning them, at the worst, do not need more than comparatively slight modifications. For example, even if we are wrong in regarding the length, shape and size of empirically (or, for that matter, of ideally) rigid bodies as a piece of inmitigable fact irrespective of any set of axes of reference, we are right, none the less, in most of our assertions concerning the standard yard at Greenwich; and if Lorentz and Fitzgerald and Einstein have taught us to accept the possibility of the variations of all lengths in respect of time, these possibilities become critical only when problems of *extrapolation* are in question. Again, granting that our planet and all its creatures are, and are set in, continua of motion, it does not follow that every piece of existence connected with these planetary creatures is itself a motion. Minds might partake in the time which they share with motion without being motions themselves, and this might be the truth even if we *know* time only through observing motion, and even if space without time would be a non-entity. The consequence we are considering would follow only if *every point of space* were temporal in its structure and if *every instant of time*, however occupied, were meaningless in all respects unless space was written clearly on its forehead. In other words, the *general* correlation of space and time, even if it is far more intimate than we commonly suppose, does not involve this special consequence; and so we are at liberty to hold (I think) that there is a very good meaning in the statement that this or that is

extended, and a thoroughly intelligible meaning in the statement that this or that, while unextended, is temporal.

The other point is more directly relevant. Granting that tables are extended, we have to remember that the tables of our common speech can be seen, and touched and heard, upon occasion. When they are seen, they are colored; when they are touched, they are hard; when they are heard, we can guess where the sound comes from. Now, assuming that the table is extended, in what sense is its color, or its hardness, or the sound of it extended? It can be proved, of course, that the spaces presented to vision are not simply identical with the spaces presented to touch, and so that their "common" space, if there is one, is either a construction from them which is not itself included in either or both, or else a contribution of the mind, or else a sort of play-house stage in which both are present and which both appear to fill, although, in fact, each of them occupies different portions of the same area. This type of problem is even more acute in the case of sounds, for although we may invest them with a tag of volume, we do not perceive them to be spread out over an area (for the sound-patterns of certain experiments are not directly perceived in hearing). It is possible, then, that many of the perceptible features of things may occupy portions of an extended volume without themselves being literally extended in any fashion to which we can assign more than a dubious and conjectural meaning; and it may even be true that colors and roughnesses, instead of being extended, are in reality *unextended* properties of extended particles within a surface. If so, the whole surface might appear to be colored or rough because the particles which have these properties are strewn very thickly within it, and the spaciousness of sound might be doubtful because the resonant particles were scattered more sparsely. Mr. Alexander, I think, suggests something of this kind and the reader

will see how often I am thinking of the delightful discussion in his *Space, Time and Deity*, although I do not profess to reproduce either his language or his meaning in detail.

With these explanations, then, we may proceed directly to our problems, and the reader will perhaps agree with me that the heart of the problem is bared in the trite and somewhat colorless formula that the mind is *dynamically* present to the brain, and *cognitively* present wherever the things of which it thinks may happen to be.

This formula, it is plain, assumes provisionally, if not finally, that mind and brain are distinct existences; that the mind can be spatially present, at any rate in its dynamic intercourse, with a part of the world; and, tacitly at least, that the mind can act on the brain (since, otherwise, its dynamic presence would be meaningless). All these assumptions are disputable, and we cannot wholly avoid these disputes. To save time, however, I shall ask the reader not to dismiss these assumptions peremptorily, and to allow that the third of them is true at any rate in the sense that, when the mind is busy, our actions (which the brain controls at least in part) are different from what they would be if the mind were quiescent. If so, we are certainly bound to consider the sense in which the mind may be said to have spatial influence.

We know, of course, that the brain is a spatial thing, extended if anything is extended: and that the experiments which indicate that there is localization of function within the cortex also indicate that this dynamic presence of the mind affects different portions of the brain at different times. The more recent researches of psychologists, however, suggest that we ought to walk exceedingly warily in these affairs. I do not mean, merely, that the first enthusiasm of Ferrier and his friends has given place to the most determined caution, that the crude hypothesis of a

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cell for each idea, and association—tracts to connect them, is almost as obsolete in physiology as it is in psychology, or that (as Dr. Jung has recently reminded us in his *Analytic Psychology*) the anatomical museums attached to most of our asylums have proved quite useless for therapeutic purposes. I mean that the whole doctrine of cortical localization may need drastic revision. If Dr. Head and his colleagues are right,¹ the cortex is really concerned with spatio-temporal correlation, and the special senses have their seat in the optic thalamus. If so, the sensory union which is normal perception must involve many portions of the brain in the exercise of its simplest functions; and cortical lesions and the like should be regarded, not as lesions in the place where the mind works in this or the other operation, but as a critical point in the whole nervous circuit which is involved whenever the mind is said to operate in any of these ways.

These perplexities notwithstanding, it is possible to argue, no doubt, that the mind acts somewhere within the brain and spinal cord, and so that it plays its part in a system of strains and stresses which have a definite position like any other field of any other force. Indeed the whole conception of restricted contact at restricted points may be as unnecessary in other departments of causal influence as in this one. On the other hand, the vaguer the connection assigned, the more difficult it becomes to state precisely what the connection is. More particularly, the difference between a spacious mind acting upon a spacious brain, and a spaceless mind doing so, tends to diminish to vanishing point. Indeed, if the mind is admitted to be a distinct existence from the brain, there seems to be no valid argument to prove that the mind itself is spatial, either in a gross obvious sense, or in a cautious subtle sense. The only plausible argument is a fallacy. To the

¹ See e. g., *Brain*, XLI (1918).

unreflective it might seem that anything which acts *at* a point, or *within* an area, must itself be situated, during the time of the action, at that point, or within that area. This idea, however, is only a generalization from our experience of causal transactions in which both partners are spatial. It loses its reasonableness, therefore, when one of the partners is seriously considered to be non-spatial. The idea of a cause is simpler than the idea of a spatial cause, and if a non-spatial thing acts upon a spatial one, what we have is a spatial *effect* upon the spatial thing, and non-spatial *action* on the part of the non-spatial thing.

This conclusion, I think, must stand, unless it can be proved that the mind is not really distinct from the nervous system, but that some form of the identity-hypothesis should be adopted. I shall therefore discuss what seem to me the most important arguments which seek to prove that mind and brain are identical.

It may be argued, then, in the first place, that the mind does precisely the same kind of work as the nervous system, and that this identity of function strongly suggests identity of nature. The work of the nervous system, we are told, is the integration of responses, and the mind has no other office. Bodily response is, firstly, selective, and, secondly, the timely coordination of these selections. Now, it is our nerves, and their appropriate end-organs, that do this work of selecting from the environment. The retina and its nerves react to light and not to sound: the basilar membrane and its neural system of transport do precisely the reverse. These selected stimuli (or, rather, the currents they arouse and continue) are motions of transition which find an outlet in the adaptations of our muscles and glands. They *must* find an outlet, and dare not lose themselves in the void like some Australian rivers. Coordination in the central nervous system simply determines *what* outlet is found and *when* it is found. This is the guiding idea of the

process, and all the facts, we are told, including the facts of mind, fit into it simply and naturally if we examine them without prepossessions. We may trace the hierarchy of these facts from simple reflexes to conceptual thought, passing from the reflexes to subconscious instinct, and thence to conscious instinct and to the inherited and acquired capacities of Styles or Nokes—or Einstein.

Stated in this form, the identity hypothesis has little to commend it except its resolute simplicity. It is useful, indeed, and conformable to the best Greek traditions, to try to define a thing by explaining what it does. Such attempts, however, are only explorations *toward* definition, since different things may often do the same kind of work. If we had good evidence, therefore, that the mind really is different from the brain, we should not need to revise our opinion simply because we discovered that frequently it did the same kind of work; and even if we chose to be illogical in this particular we might have the grace to inquire whether the work of the mind really is the same as the work of the brain. In fact, anyone who holds this belief walks by faith and not by sight. He can see, to be sure, that when our minds are directly occupied with the problems of immediate bodily response, they may fairly be said to continue the work of the nervous system, sometimes continuing it better and sometimes worse. At the best, the time of response is judged more nicely, past experience is utilized with a vague suggestion of foresight, and the "all or nothing" principle may be partially suspended in favor of some colorable effigy of economical, graduated exertion. At the worst, we hesitate and are lost, or spoil our action by wondering how the thing is done. But although these similarities of function in this restricted type of mentality are striking enough in themselves they have comparatively little relevance to mind in its infinite faculty. Even if some of our memories and a few of our

expectations could be thrust into this bed of Procrustes, the poet's imagination and the righteous man's endeavors could not; and, although this contrast may not have been evident in the beginnings of mental history, it is well to remember that things have a way of outgrowing their origins and that menials have been known to supplant their masters.

The important question, therefore, is whether we really have evidence that our minds are different from some procession in our nerves; and it is foolish, I think, to deny that, *prima facie*, we have this evidence in the fullest measure, pressed down and running over. True, it may seem extravagant at this hour to maintain, with Descartes, that we know our own minds better than anything else. Most of us, perhaps, know best what interests us most, and many of us are usually interested in other things than our minds. We should not like to be mindlessly connected with those other things, to be sure; for even the least introspective among us has no leanings towards a somnambulist army or an anaesthetised Stock Exchange. Still, many regard the mind as a *sine qua non* which is not very interesting in itself; and we need not credit them with a knowledge or an interest which they do not feel. On the other hand, it is surely most manifest that we are at least acquainted with our own minds, and that we find qualities in them that we cannot observe in other things or in our own brains. Even professors of physiology know their minds better than their brains; and the mass of mankind know nothing of brain and nerves, although they know their own joys and sorrows and conjecturing very well indeed. Our knowledge of these experiences is neither helped nor hindered by any investigations into the seat of the soul, and it makes no odds to us how doctors dispute whether the heart, or the stomach, or the optic thalami, or the frontal lobe of the cortex, or nothing at all, should be regarded as the bearers

of our experience. The identity hypothesis, therefore, so far from being an obvious or simple one, is, on the face of it, the most improbable assumption that anyone could make.

The close alliance between nerves and mind, however, and the strength of the arguments which go to prove that the brain is at least the permanent condition of our intermittent pulses of consciousness, make the identity hypothesis very tempting, and drive philosophers to seek for an indirect proof. The most plausible suggestion in this connection is the view that a man's body (and brain) is what other people can observe of him, while his mind is precisely the same thing, experienced, however, by the man himself. It would be odd, no doubt, if a man's brain from the man's own point of view had a whole world of qualities which cannot be observed by other people; and it would be stranger still if its qualities when privately experienced had not even the faintest analogue of its discoverable properties when it is publicly perceived. For what is observation if it cannot observe things as they are? On the other hand, odd things happen: there are strong grounds for believing that we cannot observe the minds of other people, whereas we can certainly observe their bodies: and if mental properties are supposed to be merely additional to, and not contradictory of, physical ones, there is no absurdity in believing that the facts revealed to these different kinds of observation may have little or nothing in common.

As it seems to me, this way of arguing is more seductive than solid because it is based upon a contrast within experience which does not, in fact, support the identity hypothesis. Whether we have private acquaintance with many parts of our brains or not, we certainly have private acquaintance with many other parts of our bodies. We feel pleasure and thirst and hunger, and no other person can directly observe these bodily facts. In a word, the fact that our organic and kinaesthetic sensations are private.

not public, is the *whole* of the difference between experiencing our own bodily life and observing the bodily life of other people. Now it is clear that organic sensations are logically on the same footing as any other sensations. If I am right in believing that the table is brown because I see it so, I have precisely the same right (and the same duty) to believe that my throat is parched, not merely in the way which a doctor could see, but in the way in which I sense it. And so on any other hypothesis. Organic sensory qualities are spread over the interior of my body as color is spread over the exterior of my table. We have empirical warrant, therefore, for maintaining that organic sensations occupy an area which is identical with the area of the body which others perceive; and we know from experience what the difference is between our bodies from our own point of view and from the point of view of other people. But how do these facts apply to the mind? A sore foot is not a mind, any more than a brown table is, and this contrast of public and private observation does not help the case. If I felt my mind to be within my body I might have a slender justification for the identity hypothesis. Otherwise, what justification is there?

One of the most interesting features of Mr. Alexander's recent discussion of the question is that he makes precisely this claim. The experience of most psychologists, as reflected in their works, is that our minds are not felt to be spatial except in so far as they are felt to be blended with organic sensations in some Cartesian *mélange confus*. Mr. Alexander, however, distinguishes sharply between our mental "enjoyments" (as he calls them) on the one hand, and our organic sensations and bodily properties on the other hand; and yet he argues that these "enjoyments" are spatial and that the identity hypothesis holds.²

² See *Space, Time and Deity*, especially Book I, Chaps. III, IV, and Book III, Chap. I, A, and IV, B.

If these "enjoyments" were felt as spatial, Mr. Alexander's form of the identity hypothesis would have much in its favor; and, of course, the mind would be spatial. To the objection that two wholly different things cannot be identical unless one at least is transformed, Mr. Alexander replies that the two are not wholly different, and that the one may really "carry" the other. He does not suppose, it is true, that thinking is only a physiological property. On the contrary, he believes that a new property *emerges* when thinking occurs, so that we have neither brain *and* thought, nor thought which is only a mode of brain. Still, when there is thought, the brain, he says, "carries" a new property which, none the less, is really in it, and, because we "enjoy" our thoughts as spatial, we are justified in believing that our thoughts occur within the brain's volume precisely as we are justified in believing that our organic sensations have their place within the physical body. *Where* precisely our thoughts are, we need not seek to know more minutely; and, perhaps, we should not. After all, it is rather foolish to ask whether life is extended, and where precisely it is; and yet no one denies that extended things are alive. So perhaps they may "mind" as well as live.

Mr. Alexander finds that his mental acts are transitions (or motions) which have "direction" severally, and "structure" conjointly. These transitions, however, are not sensations of movement. The assent of judgment, he tells us, must be sharply distinguished from the nod of the head or the closing of the glottis, and, by the same logic, are even more trenchantly divided from the whole path of the nervous current. "Direction," therefore appears not to be direction, and "structure" not to be structure; but Mr. Alexander means, I think, that the pulse of mind is, as it were, a beat of transition epitomising a whole movement in itself; and this beat of transition might "carry" mind

even if it were but the moment of passage at a synapse, as a well-known theory declares.

I must confess that I cannot find this spatial character in my own "enjoyments"; and I am in excellent company. The empirical fact of connection between mind and body (which, in some sense, is indisputable) seems to me to express all the observable data in the case, and this fact of connection may obviously be interpreted in a great many ways. It must be admitted, however, that Mr. Alexander's theory would probably be the simplest and the best if he were right in his view that all thinking is a species of "conation," and if "conation" were simply what he describes.

A conation, Mr. Alexander thinks, is just a movement, the kind of movement which a mind makes. Such a movement is practical when it issues in muscular action, speculative when it stops short of this and is either arrested or else diverted in some other direction, e. g., to the making of words. This contention, however, is surely most disputable and most improbable. Speculation, I think, may continue without any arrest or diversion of action; but, even if were not so, it would not follow that speculation is nothing but these. Again, if the conation really were diverted, one would suppose that it would become a different conation, and thus that the speculation which epitomizes it would become different also. For example, we know very well what it is to pass from fisticuffs to verbal abuse. It is but metaphor to say that verbal abuse is speculative fisticuffs. And yet there is no genuine difference between this metaphor and the other metaphor which states that thinking is an action diverted into word-making. We know that kind of diversion, and we do not identify it with what it is not. Moreover, an arrested conation is in no better case than a diverted one. We know what baulked or inhibited conation is, and we do not identify it with thinking. Indeed, even if these arguments were unavailing,

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it would seem, nevertheless, that Mr. Alexander's theory brings him into a very strange harbor. If our thinking were virtual action in the literal sense (i.e., the beginning of an action which we experience in its incipience) we might admit the validity of his interpretation provided that this incipient action were restricted to the places that such action could reach. On Mr. Alexander's theory, however, these incipient conations (which are literally within our heads) *are* our knowledge of the world outside us. They are our direct perception of a nine-year-old Sirius, our direct acquaintance in memory with our college festivals and our childhood's games. According to the theory, therefore, these conations reach the borders of the stellar universe, and they may extend into an earlier century.

It seems incredible that these powers could belong to a movement wholly enclosed within the brain, and it would plainly be far simpler to suppose that the mind, in a certain sense, is dynamically (or at least physically) present wherever it is cognitively present. This theory, in some form or other, has also been mooted very seriously in recent times: and so it calls for comment.

Let us take an analogy. When there is no light, things have no color; when light illuminates them, they are colored. Why should we not suppose, in the same way, that things are soulless when the mind passes them by, and that they are conscious when the mind reaches them? It would not be necessary to suppose that consciousness does anything to the things except to reveal them. Things do not reveal themselves simply because they exist, and this new and wonderful quality is a sufficiently large difference for even a mind to make. If, then, we regard the mind as a light playing upon things, there is no difficulty in believing that it is literally present at every point in space where, as we say, it is cognitively present.

The form in which this theory is commonly presented

is somewhat different from the possibility which I have sketched above. The doctrine is usually stated as if it could dispense with consciousness altogether, and as if what we call consciousness were only an aspect of things. Such an interpretation plainly rejects the very analogy on which it climbed. It speaks as if sections of things could be illuminated without any light to illuminate them, or as if "being" and "being revealed" were one and the same. There is little advantage, I think, in considering any theory which has such an aching gap in it, and so I shall deal with this hypothesis in the more plausible form in which I have stated it.

If the mind is really spatial, this theory seems to me to give by far the most promising account of its spaciousness. It seems reasonable to hold that the mind literally inhabits the whole area which is bounded by its perceptual horizon at any given time. When it perceives the sun from the earth, it may be at the sun and at the earth and it may even span the intervening millions of leagues. When, as we say, we are in Dover listening to the guns at Zeebrugge, the truth may be that our minds are in Zeebrugge as well as in Dover; and, perhaps that they stride across the Channel. And so of the other senses. Perhaps, even, it would be possible to maintain that the mind may literally be present at places with which it has only a conceptual acquaintance, although, in that case, there would be little meaning in supposing it to occupy the intervening positions. Indeed, we could scarcely accept this idea unless we supposed that thinking of a thing at the back of our heads (in its visual character) were the same as seeing it before our eyes. Still, peaks may glitter in an expanse which is itself dark; and, similarly, scattered patches in the boundless expanse of the universe may be revealed for a moment while their surroundings may not be revealed. The status of images would present no difficulties on this interpretation, since

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images may plausibly be regarded as portions of perceptible things whose surroundings are not perceived or, if the reader prefers, as half-recollections emancipated, for the time being, from the perceived order of space and time.

It would not be impossible to account for, or at least to include, the rôle of the body according to this hypothesis. The body, on the theory, would be perceived or revealed, broadly speaking, like any other physical object; but it would have a peculiar importance among revealed things, and it would very easily come to be regarded as the true and proper habitation of the mind. The horizon of sight or of hearing, to be sure, is indefinitely larger than the horizon of the body, but most of the other external senses cannot stray very far from the body, if indeed, like heat and cold and perhaps touch, they are not restricted to the surface of the epidermis. Now, when we are conscious, we do not always see or hear, and the only external things of which we are constantly aware are the warmth or coolness of the atmosphere and the pressure on our skin. Again, we are constantly aware of our organic sensations, and these, as we have seen, have their place within the body. The body therefore, to use Berkeley's phrase, is a "tunicle of the soul" in a sense in which nothing else is. It is not the soul's only garment, but it is the only constant one. We carry our organic sensations along with us as we move from scene to scene; we interpret our muscular sensations as indications of the position of things; if we see anything, we see it from the place where we feel our limbs. In a word, the place of our bodies is *always* our place, and no other place is *constantly* ours. The very illusions of personal identity bear witness to the same truth. A well-worn garment may seem to be part of *us*; a new one never does; and any abrupt change in the mass of our private "vital" sensations makes us doubt our identity and may even con-

vey us to a madhouse because we think we have become brittle and therefore dare not move.

To be sure, the problem of the difference between cognitive and dynamic presence would still remain, but the sting of it might be drawn. We have no reason to believe that we act upon the sun when we see it—there are very few who have dreamt of this telekinesis—but we have every reason to suppose that we can act upon our bodies, and that these, in their turn, can manipulate things. It is not absurd to conjecture, however, that only certain things respond to the contact of minds (except in the way of revealing themselves), whereas the nerves of the body respond in other ways, and set the muscles working. Selective action of this kind on the part of physical nature is not at all unusual, and if we chose to be fanciful we might even imagine that our minds (within narrow limits) have learned how to make use of the nerves, and have been too lazy, or too stupid, or too indifferent to learn how to affect anything else.

It seems to me, therefore, that this theory gives by far the best description of the place of the mind, if the mind indeed has a place; and, personally, I should accept it without hesitation or reservation if I saw any good reason for believing that the mind is spatial at all.

What I find to be spatial by direct inspection are the colors, sounds and smells which I perceive outside my body, and the toothache, muscular sensations, and the like which I find within it. These sensory data are the elements of the perceived spatial world; and we know of no others. It is true that imaged and remembered things, dream spaces and recollected places, are also spatial; but their elements, as has been hinted, are borrowed from the perceived world; and it is not impossible to admit their spatiality, and yet to deny consistently that there is any empirical spatial world other than the world of perception. To speak of the

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perceived world, of course, does not imply that this world is exhausted in any one's perception, or that it is opposed in its essence to conceptual space. What is meant is that parts of it are given directly in perception, and the rest pieced together, expanded (and winnowed) by reflection.

While this, I think, is true, it is of course impossible to *demonstrate* that the mind is non-spatial. The arguments which seek to prove this conclusion are, without exception, bad ones. Thus it seems very certain to most of us that we can think of many things (numbers, for instance) which are not themselves spatial; and hence we might rashly conclude that these thoughts, at all events, are non-spatial. That is a fallacy however; for the thoughts might be spatial, although their objects are not, just as thoughts are plainly temporal although their objects need not be. Or, again, we may be warned against confusing between the delight in good literature, let us say, and the "somatic resonance" (or the organic sensations) which normally accompany this delight. This warning is just, for these emotions are not identical with the organic sensations, but, although different, they might still be spatial. Personally, I think they are not; but if any philosopher says that they feel spatial to him, it is impossible to prove to him, on general grounds, that he must be mistaken.

What I have sought to prove is something less than this. My point is that, *unless* we are assured by direct inspection that our minds are spatial in their essence, we have no good reason for supposing so, on the ground of general theory. Indeed I think that the weight of general argument is against the spatiality of the mind, and I shall conclude by giving my reasons for this opinion.

The most distinctive features of the human mind, I think, are its sentiments and its logic. Now the sentiments play upon the whole gamut of the emotions, ringing out a response according to the condition of the thing towards

which the sentiment goes out. To use the stock illustration, the mother is alarmed when the child is in danger, tranquil when it is safe, tender towards it at every time. I cannot see that this relationship of the emotions is spatial in any sense worth the name, and yet it is this very relationship which is the distinctive way in which the emotions of the mind are organized; and I do not see that any adjacence of nerves could give the slightest hint towards an explanation of this relationship. The case of logic is even stronger. However illogical from a strict academic standpoint the mass of mankind may be, still, men try to think. Even the Bushmen do, although they cannot count up to ten. And what has space to do with logic? Is there not an impassable gulf between the search for identity of characteristics and any sort of spatial conjunction? Let us suppose, *per impossibile*, that logically correct inferences always follow one set of channels in the brain, and illogical ones another. Suppose, even, that the path of these processes could be mapped out, and that teachers of logic could show the chart to their pupils. Would that *explain*, or help to explain, what logic is, or how it satisfies? There does not seem to be even the rudiments of an explanation on lines such as these.

Those who have attempted in the past to weld psychology and physiology into one have commonly argued as if the whole problem were summed up in the coherence of motions in the brain, of the one part, and the association of ideas, of the other part. It is unnecessary nowadays to show that the association of ideas is only a small part of psychology; but even if association were the whole of psychology, one might venture to ask how the spatial paths in the brain could account for anything in this vain theory, fondly invented, except association by contiguity. If A has been experienced along with B, the revival of A might readily arouse B by mere spatial irradiation into contigu-

ous paths. On the other hand, irradiation of this or any other kind could never teach us to detect similarities of character, or to think according to that fashion. And without similarity, where would association be?

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PSYCHOLOGY AS BEHAVIORISM.

I.

A characteristic of the knowledge that is called science is that it is *organized*. A number of disconnected facts, however large, is not a science; though, if the number be very large, the facts will not be altogether disconnected, things being as they are. How much connexion there ought to be if a group of facts is to be called a science, it is impossible to say, partly because there is no precise method of determining degree of connexion, and partly because *accuracy* also is a characteristic of scientific knowledge. Thus, the term science may be applied to "facts" if their accuracy is great though their interconnexion is small, or to "facts" whose interconnexion is great but whose accuracy is doubtful. While accuracy is certainly important, the degree of interconnexion is always of the very greatest theoretical interest. This interconnexion is expressed in principles, and hence, in science, discussion of principles is a highly important task. Its relevance in psychology is especially great at the present time. Any serious attempt to formulate psychological principles or to estimate the adequacy of proposed principles; to organize, for instance, the large number of empirical facts which experimental psychology has collected and is still collecting, or those other facts, bidding fair to be still more numerous, which are being brought to the light of day by psychoanalysis; any such attempt is worthy of consideration.

largely on its own account, that is, because principles are essential to science. But at the present time, the psychologist who possesses a conscience at all metaphysical,—who proceeds at all metaphysically in the sense that he tries obstinately to think clearly and consistently,—tends to wince at formulations of psychological principles which seem to manifest, not merely haste, which is natural enough in so commercial an era, but an almost incredible innocence of metaphysic. The present psychological situation, in brief, is one in which principles of psychology deserve special attention.

II.

By Behaviourism is here understood the theory of the subject matter and methods of psychology which has been expounded most fully by Prof. J. B. Watson. This theory consists essentially of two propositions:

1. The subject matter of psychology is behavior exclusively;
2. Behavior is scientifically explicable without reference to what are commonly called mental facts or processes.

Definitions of Psychology.—Modern definitions tend to say that the subject matter of scientific psychology is mental states, processes or phenomena. Thus, James followed Ladd in defining psychology as the "description and explanation of states of consciousness as such."¹ Ward, it is true, in explanation of what he means by saying that the subject matter of psychology is "individual experience" states that "individual experience" is meant to indicate "above all conative activity or behavior"²; but, though this explanation would seem to suggest more than a verbal difference between his definition and that of James, the exposition of the science by the two psychologists makes

¹ E. g., *Text Book*, p. 1.

² *Psychological Principles*, p. 28.

it clear that the problems regarded as providing the subject matter of psychology are much the same for both of them, and that the differences in their definitions are largely verbal. We need to be told, no doubt, that "individual experience" is intended to mean "above all, conative activity or behavior"; but, equally, we need to be told why instinctive behavior should monopolize a considerable section of a work devoted to the investigation of "states of consciousness as such." Again, some years ago, McDougall stated that psychology might be *best and most comprehensively defined* as the positive science of the conduct of living creatures.³ But he presently discussed, as psychological questions, the attributes of sensation and feeling tone of images; showing, at least, that his definition did not comprehend the whole of the subject matter of the science, while his general exposition indicated this subject matter to be much the same for him as for James and for Ward, notwithstanding the special direction of his attention to certain problems.

The fact is that definitions of psychology are generally framed so as to emphasize some neglected problem or method, and that no definition yet offered of the subject matter of the science suggests, in a natural way, and without further explanations, the variety of problems the science includes. This is not said in criticism but stated as a fact. It suggests that the actual subject matter of psychology is a number of problems, which can be enumerated one by one, but which present sufficient diversity to make a brief and precise definition of the science extremely difficult, if not, in the logical sense of definition, impossible. It is thus to be expected that verbal definitions of the subject matter of psychology should be inadequate. If they begin by emphasizing consciousness, they will find it difficult, in the end, to include conduct; and if they begin by empha-

³ *Physiological Psychology*, p. 1.

sizing conduct, they will find it difficult, in the end to include states of consciousness.

The Behaviorist Definition.—The behaviorist definition endeavors to attain adequacy by elimination: it restricts the scope of the science, and excludes certain traditional problems. For when the behaviorist defines the subject matter of psychology as behavior, he does not intend this to be interpreted to mean much the same as is meant by James or Ward in their definitions. When he says behavior, he means behavior and *nothing but* behavior. "The time seems to have come" says Professor Watson, "when psychology must discard all reference to consciousness." (*Behavior*, p. 7). Again: "It is possible to write a psychology . . . and never to use the terms consciousness, mental states, mind, content, will, imagery and the like" (*ibid*, p. 9.). This can be done "naturally and conveniently" in terms of behavior. The behaviorist maintains that he does not know what such terms as perception, sensation, image and feeling, mean.

He knows, however, what is meant by behavior. This is the "total striped and unstriped muscular and glandular changes, which follow upon a given stimulus."⁴ The stimulus need not originate in the space external to the body, for muscular and glandular changes within the body may themselves act as stimuli to further muscular and glandular changes. But, however caused, these "reactions" are identical with "behavior," and make up the subject matter of psychology (*Psychol. Rev.* 1917, p. 336).

Although this conception seems to restrict the field of psychology in a somewhat startling manner, it leaves it sufficiently large to allow for active research. The behaviorist begins with the child as soon as it is born,—or, more accurately, as soon as breathing is established. At this

⁴ Watson's *Psychology*, p. 14.

stage, he attempts to determine what reaction tendencies are *instinctive*: for example, whether the new-born infant possesses innately the neuro-muscular coordinations required for swimming. A small bath of water at body temperature is held in readiness, and (when breathing is established) the infant is slowly lowered into it supported on its back by the experimenter's hands. When this experiment was performed, the particular infant who acted as subject manifested violent signs of fear but no coordinated swimming movements.⁵ Clearly numerous experiments of this sort are conceivable.

The infant is then followed through childhood to adulthood with appropriate experiments at each stage. The behaviorist tries to determine, for instance, what are the reactions of a six-months old infant to living furry animals. It is therefore held by its mother in a well-lighted room and shown successively a white rat, a dog, a cat, a white rabbit, beetles and a snake,—its responses to the various objects being noted and subjected to analysis.⁶ Much information about human instincts may be acquired by such experiments. But in addition to innate reaction tendencies there are those that are acquired,—problems of habit or learning; and here the field is very wide.

And the apparent restriction of the scope of psychology is not so great as it would, at first sight, appear to be, because certain problems which it might seem would be excluded, are so modified as to be included. Thus the behaviorist includes all problems connected with the range of sensory stimulation. To determine the *range of visual sensibility*, for instance, is a behaviorist problem. But the subject is never to be allowed to say that he "sees" a light or colour when visual stimuli are directed to his eye. "Ordinarily" says Professor Watson, "we mean when we

⁵ Watson's *Psychology*, p. 243.

⁶ *Psychol. Rev.* 1917, pp. 343-344.

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say that an animal is sensitive to difference in wave-length that such stimuli play a part in the adjustment of the animal to food, shelter, escape from enemies, etc., *i. e.*, *that such stimuli initiate activity in arcs which end in striped muscles.*" And so, in experiments, the visual stimulus is *made* to initiate activity in arcs ending in striped muscles. This is achieved by the creation of a *conditioned reflex*. The subject rests his hand upon an electrode, and, to begin with, whenever visual stimuli well within the range of "visibility" are presented, a shock is given, which causes the subject to move his hand. By the repetition of this process, it soon comes about that, when a light is "seen," the hand is moved in a characteristic manner, even when no shock is simultaneously given. And the experimenter can, at this point, take the movement as a sign that a color or light is "seen" (or that the given stimulus is among those that play a part in the adjustment of the subject to food, shelter, etc.). There is no need in such a procedure to use the troublesome word "saw" (or "see"); there is no need for the subject to speak at all. The experimenter knows that, when the characteristic movement of the hand does not occur, the visual stimulus is outside the range of visibility (provided, of course, that the conditioned reflex has not temporarily broken down through fatigue or some other cause, *and that the subject was attending when the stimulus was given.*)

The behaviorist, then, whatever be his difficulties, is not likely to suffer from lack of problems to investigate. Further, his problems are psychological problems, for they are of the types that find a place in standard expositions of the science; if these were appropriately called psychological before, there can be no reason to deny them that title now. Further still, there can be no real objection to the behaviorist applying the term psychology to these problems exclusively. That, in itself, might be a matter of taste and

⁷ Watson's *Behavior*, p. 354.

convenience in the use of words, and all that it seems reasonable to say is that the current and traditional usage of psychology is different from this.

But the complication is not simply verbal. Professor Watson says, no doubt, that his conception of psychology excludes many problems with which psychology has been historically concerned;⁸ that he does not know what such terms as image, feeling and will mean, and that he can get along quite well without these terms. But he does not mean that he is dividing to conquer; that the excluded problems are genuine enough and that the discarded terms have genuine reality as their meanings; that he has not adequate time, or perhaps interest, to investigate these problems, and so will limit his field. He is not like the artist who says "My work is Art," or the scientist who says (to the artist) "My work is Science." It is rather as though the artist said to the scientist: "There is no such thing as science." For the behaviorist denies the existence of any mental reality. It is not easy to say what is the relation of his position to the later views of James or to the view of the American new-realists; but it is not difficult to determine what the position is in itself. It becomes unambiguous in the form that the only phenomena which could be called mental are muscular and glandular changes. What is to be said of this theory?

III.

Among the phenomena commonly called mental are images and feelings, and these may be used to illustrate an argument which can be applied equally well to *all* "mental" phenomena. The behaviorist must say either that images and feelings do not occur at all, or that, occurring, they are identical with muscular or glandular changes. Now the empirical evidence for the occurrence of images and

⁸ *Psychol. Rev.*, 1917, p. 336.

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feelings is final. If the behaviorist raises a doubt, the answer is that this evidence is as convincing as the evidence for the occurrence of muscular and glandular changes. We observe the one sort of phenomena as assuredly as we do the other. Taking the *occurrence* of images and feelings, then, as beyond doubt, the behaviorist's position must be that these are identical with muscular or glandular changes.

Against this view, the evidence is also conclusive. And this evidence is again of the type admitted, though not discussed, by the behaviorist: it is observation. We need not consider here how much is involved in observation,—for instance, to what extent it requires judgment. It may be taken and used here as it is taken and used by the behaviorist. Muscle movement, for instance, is something that the behaviorist *observes*. He “sees” it when someone crooks his finger or swings a racket. It is important that the behaviorist bases his position upon observation, and that he does not mean, for instance, by a muscular change, certain spatial changes in the relationships of certain ultimate constituents of matter. No: the muscular or glandular change is a straightforward sort of thing. We can observe both it and its effects.

We have thus to compare what we observe when we say we observe behavior with what we observe when we say we are aware of images or feelings, and to ask whether what we observe in the one case is identical with the object of our observation in the other. The answer is most positively that the two are *not* identical. It is *as clear* that a muscular or glandular change is not an image or a feeling *as* that a muscular movement is not a glandular change. The evidence is of precisely the same sort in the two cases. We perceive in both cases that the objects under comparison are different. There is no more reason to say that an image or feeling is identical with a muscular or

glandular change than there is to say that the two latter are identical; and there is *at least as much* reason for denying identity in the one case as in the other. Of course, if our judgments of difference are all false; if tables are identical with chairs and anything is identical with anything else; then images and feelings may be identical with muscular or glandular changes. But we must surely accept our experience of difference as valid until it is demonstrated to be invalid; and the point is that here is a judgment of difference that has not been shown to be invalid.

The same argument applies to all the phenomena currently recognized as mental. The question does not here arise whether images and feelings are *conditioned* by glandular or muscular changes: our question concerns their identity.

IV.

In one instance the behaviorist has attempted to *demonstrate* identity between a phenomenon traditionally regarded as mental, and behavior as defined by himself. This mental phenomenon is thinking. The behaviorist is forced to consider thinking in detail because of the phenomena of delayed reaction. Whenever a response follows relatively immediately upon a stimulus, it is plausible to say that the "sufficient" explanation of the response is this stimulus. But response and stimulus are sometimes separated by considerable intervals of time during which thinking "goes on." It is necessary for the behaviorist to reduce this intermediate activity of thought to muscular and glandular changes.

The evidence adduced to show that thought is identical with certain behavior, as above defined, is of two sorts. (1) The first attempts to show that, when we think silently, movements of the speech muscles occur. The experimental work of the behaviorists in this connection is of consider-

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able interest, and will, eventually, in all likelihood, prove still more interesting; but its value as evidence is exactly nil. *In the first place*, the experimenters have had to admit that in some cases of silent thinking, present experimental technique has been inadequate to indicate any muscle movements of the speech mechanism. To this it has been said that present apparatus is faulty and that further refinement of method should give better results, which is true enough; also, that when the apparatus did not show muscular movements during silent thinking in the *speech* mechanism, it was possible that the thinking was then being carried on by movements of *other* muscles in the body. For while the speech muscles are the ones most generally involved in thought, others are not excluded from functioning similarly, and it is, in a way, accidental that thought is constituted by movements of the speech muscles. All which, being so largely supposition, is valueless as evidence. *And secondly*, nothing whatever as to the identity of thought and behavior would be proved even if it were established that muscular changes in the speech mechanism *always* occurred during silent thought. It might simply be a case of concomitance, like a man and his shadow.

Behaviorism admits the weakness of the above line of evidence, and attempts another. (2) This second sort of evidence consists of an attempted reconstruction of the first processes of thinking in the child. Such reconstructions as this are usually not convincing, though the present case is not so bad as those that concern primitive man; but putting this aside, we may consider the present case on its merits.

The general theory is that thinking consists in the fact that certain behavior, *generally* movements of the speech muscles, *operates as a substitute* for other behavior. Thus, the man who excogitates a new aeroplane engine is doing, primarily with his speech muscles, what he could do equally

well, if less conveniently, with the muscles of his arms, legs and trunk. If he were to make the engine by movements of the latter muscles, in simple response to stimuli in the environment, he would not engage in thought at all; but when he sits at his desk apparently motionless, thinking the matter out, movements of his speech muscles are substituted for those of his arms, legs and trunk, and in this substitution we are to see the essence of thought. Although the motionless thinking man may appear to be physically inactive, the muscles of his speech mechanism are as full of movement as his arms and legs would be if he were playing tennis.

This substitution of movements for movements occurs on the principle of the *conditioned reflex*. If a hungry dog be shown food, his salivary glands will become active and secrete. Powlow found that if a dog were repeatedly given another stimulus simultaneously with the sight of the food, the second stimulus soon caused activity of the salivary glands in the complete absence of food. A *conditioned reflex* had been established. In the case of thought, the conditioning reflex is constituted by movements of the large muscles of the body in response to environmental stimuli: the movements of the speech muscles are the commonest of the conditioned reflexes. When we try to see this process in mature thought, the task is doubtless a difficult one. Let us, however, follow the behaviorist⁹ as he attempts to show that the earliest processes of thought are simply *conditioned reflexes*.

V.

In the development of the earliest act of thought, as this is described by Professor Watson, six stages may be distinguished.

1. First, habits are formed which, though vocal, are not language habits: they do not constitute genuine

⁹ Cf. Watson's *Behavior*, pp. 328-331.

thought. They originate as responses, imitative in form, of external stimuli chiefly, though doubtless to some extent they are due to intra-organic stimulation, the infant instinctively uttering certain noises. The sound of a word is a stimulus to the infant to utter it, and a hundred or more words may be acquired in this way. This is the parrot stage, and no thinking is involved in it.

2. In the second stage, the child has acquired, in addition to the foregoing vocal habits, a number of others involving the exercise of arms, hands, legs and trunk. Movements of these parts of the body regularly occur in response to specific stimuli in the environment. The child *grasps* its rattle, for instance, and *shakes* it. Habits of this sort, that is, habits involving the exercise of arms, hands, legs and trunk are considered essential for the development of thinking. A paralytic child, apparently, could never think. So far there is no essential difference between the child and the parrot: both have acquired habits of moving the larger parts of the body and both can emit sounds.
3. The next step is held to carry the child to a plane as yet reached by no animal save man.¹⁰ It is described somewhat as follows. The nurse, observing the child to react characteristically to a certain object, say a ball, says "ball" whenever this reaction occurs. The spoken word acts as stimulus to the child to utter it in accord with stage (1). The repetition of this procedure produces a conditioned reflex. To begin with there are two stimuli (or groups of stimuli), (a) the sight of the ball, (b) the spoken word ball (spoken by nurse); and two

¹⁰ *Ibid.*, p. 329.

responses, (*a*) arm, leg and trunk movements to the sight of the ball, (*b*) speech muscle movements necessary to say "ball" in response to that word as spoken by the nurse. Hence, the child presently makes both responses to the mere sight of the ball: when it sees the ball, it moves its arms, legs and trunk suitably, and at the same time says "ball."

It may be remarked in passing that all this appears to find a perfectly satisfactory and straightforward explanation in terms of association. Not that the behaviorist denies this; but why does he say that no animal save man has reached this stage? It is certainly true, at any rate, that conditioned reflexes can be produced in lower animals.

4. The essential fact in the fourth stage is that many instances occur in which the early arm and leg responses to specific stimuli are frustrated: for instance, the ball is on a shelf and cannot therefore be grasped, or rolled along the floor. Two responses have been established to the sight of the ball, the arm, leg and trunk movements, and the word "ball"; when one is frustrated only the other occurs. Hence, in many instances the uttered names of objects are the only responses made to them.
5. The fifth stage, not clearly distinguishable from the fourth, seems to consist of the results of numerous particular cases such as that indicated in the fourth stage. The greater frequency with which the uttered word response to objects occurs, tends to establish that response to the exclusion of others. Note broadly what has happened. Movements of the speech muscles have been "substituted" for move-

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ments of arm, leg and trunk muscles, and thinking, identical with this substitution, has begun.

6. The final stage in the development is the occurrence of the word without the stimulus of the ball. But this presents no difficulty. Many objects have been seen along with the ball, and by association the sight of any one of these may excite the response,—spoken word “ball.” The stimulus may even be intra-organic. As the network of associations is rapidly woven by early experience, it is soon possible for any one of a multitude of stimuli to give rise to word responses.

And thus we have reached “true language habits,” *that is*, thought. Presently, the vocal gives way to subvocal thinking, owing to demands of the social environment; the movements of the speech muscles become more refined, and are modified variously, so that words are not now *uttered* in thinking. But nothing new in principle is involved in the subvocal use of the complicated structure of language as we know it.

Any plausibility this theory possesses is due to two factors; its emphasis upon the muscular movements *connected with the uttering of words*, and its assertion that we have, in thinking, essentially a “substitution” of certain muscle movements for others.

Concerning the first of these points, the recognized actual close connection between words and normal thinking is here a cause of some confusion; but the behaviorist maintains that the essence of the matter is the *substitution* and *not* the particular muscles involved. It is not necessary that the substituted muscle movements should be movements of the speech muscles.¹¹ Any other muscles will

¹¹ Cf. *Behavior*, p. 325. (The reference to “bodily language” habits).

do as well, provided only that there is muscle movement substitution generated by conditioned reflexes. Where does this lead us? Let us, in a perfectly legitimate way, trace the development of early thinking in a hypothetical case in which the substituted muscles are *not* those of the speech mechanism. We shall have six stages, as before.

1. As the speech muscle movements are to be excluded from this process, we shall not begin with the vocal non-language habits but with others. Let us suppose that at a very early date in its life, an infant acquires the habit of withdrawing its right foot on the application to it of an electric shock. We begin, that is to say, with stimulus and response, as Professor Watson does, the difference being simply that our response and stimulus are different from his,—chiefly in the fact that responding muscles are different. (The one case considered may be taken as representative of a whole class of similar cases).
2. In the second stage, the child has acquired a number of habits involving the exercise of arms, legs and trunk. Let us suppose that one of these is the withdrawal of the left foot when touched by a cold object.
3. This step is very important. The nurse, observing the child to withdraw its left foot upon its being subjected to a cold stimulus, decides to give the right foot an electric shock whenever a cold stimulus is applied to the left. This is exactly similar to the situation in which the nurse, when she sees the child make a characteristic response to the sight of the ball, says "ball." And, in each case, the nurse's procedure provides a stimulus to the infant. In Professor Watson's case, the child says "ball": in

the present case, it withdraws its right foot. Here, to begin with, there are two stimuli, (a) cold stimulus to left foot, (b) electric stimulus to right foot; and two responses, (a) withdrawal of left foot, (b) withdrawal of right foot. Hence, the child presently makes both responses when the electric stimulus is alone applied. That is, as response to the electric stimulus applied to the right foot, the child now withdraws *both* feet; just as it comes both to say "ball" and make appropriate arm, leg and trunk movements at the mere sight of the ball. *A conditioned reflex has been established.*

4. The essential fact in this stage is the frustration of one of the two responses. Let us suppose the infant's right leg becomes paralyzed: this would correspond to the case in which, in Professor Watson's account, appropriate responses are prevented because, for instance, the ball is on a shelf out of reach. What happens now when the electric shock is applied to the right foot? *The child withdraws its left foot only.*
5. This stage will be constituted by the results of many particular processes in the organism similar in principle to that described (in which one movement has been substituted for another), thus giving us many instances of *thought*.
6. The final stage is the withdrawal of the left foot at times when the electric stimulus is *not* applied to the right foot. This presents no difficulty. Many objects have been seen at times when the electric shock was given and the left foot withdrawn; and now the sight of any one of these, by associative connections, may cause the withdrawal of the left foot.

The process just outlined contains all the stages of Professor Watson's process, and the laws by which it develops are identical with the laws by which his process develops. The *only* difference is that the particular muscles involved are different. Hence, the behaviorist must admit either that his account of thinking is inaccurate (since he maintains that the speech muscles are not essential to thinking), or that any phenomenon of the kind just described is a case of thinking.

The second alternative cannot be accepted. The reason is briefly this. We are acquainted with thinking, experiencing it as directly as we ever experience muscle movement; and when we compare what we are acquainted with as thought with what we are acquainted with as muscle-movement substitution, we see that the two are *not* identical. They are no more identical than a muscular movement of the right forearm flexor is identical with a muscular movement of the left thigh abductor. The evidence is of the same kind in the two cases,—direct experience. And, let it be said emphatically, it is entirely unnecessary to know everything or even much about thought in order to justify this argument. We may know that red is different from green and not another thing about either. It is psychologically false to suppose that knowledge of difference based upon immediate experience involves any other knowledge.

This brings us to the second reason for any plausibility in the behaviorist's theory of thinking. This, it was said, consisted in the behaviorist's use of the term "substitution" to indicate the essence of his theory. Now, precisely what does the behaviorist mean by muscle movement *substitution*? I may substitute a movement of my right hand for a movement of my left hand in putting on my hat: in short, whenever any purpose realized through the activity of certain muscles comes to be, or happens to be, realized

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through the activity of other muscles, we may speak of muscle movement substitution. But according to the behaviorist, substitution occurs when, for instance, I *think* of putting on my hat. Nevertheless, when the speech muscle movements associated with (or constitutive of) this thought occur alone, my hat does not get on to my head. Evidently, this sense of substitution is not intended. And, in fact, there is only one sense of substitution which can be legitimately intended by the behaviorist, and this is that which indicates *simply* the phenomena of *conditioned reflex*. Substitution of this sort, however, is *not* the substitution which is actually involved in thinking, and which may be expressed, briefly, as the use of words (or other material) as signs. We know that the behaviorist's theory is wrong because we know that the latter sort of substitution is *not* muscle movement substitution,—however closely muscle movement substitution may be associated with certain forms of it.

VI.

The second proposition of which behaviorism was said (Sect. II) to consist is that behavior is scientifically explicable without reference to what are commonly called mental facts or processes. If the behaviorist were right in his attempted reduction of mental life to muscular and glandular changes, he would of course be right in his second proposition; but this second proposition might, logically, be true, even though his attempted reduction were a failure,—as it is. His position would then approximate to psycho-physical parallelism, and the question would be what new evidence in support of this theory, the behaviorist advances.

It may be said at once that the behaviorist brings forward no evidence in support of the theory that behavior is explicable without reference to mental life, except such

as he adduces in support of his position that there is no mental life. Indeed, his second proposition is a corollary to his first. His admission that thinking, in his sense, affects behavior means simply that he inserts certain not very easily observable physiological links in a physico-physiological chain. His first proposition leads him to suppose that the chain has no links that are not either physical or physiological; but he offers no positive evidence that this is so. We may therefore say that the behaviorist has left the body-mind problem exactly where it was.

Two remarks, however, are relevant here. First, we need some criterion of an *adequate* explanation of any given conduct. In the absence of such a criterion, it is easy to offer inadequate as adequate explanations, on the one hand, and to give over-adequate explanations on the other. It would seem to be desirable strictly to limit explanatory facts, in this connection, to those facts from which specific behavior *can be inferred*. In theory this may seem easily possible; but practice here falls far behind the logical ideal. If the behaviorist admits this conception of an adequate explanation, and maintains that he is simply endeavoring to show that the adequate explanation of behavior is physical stimulus plus behavior, we have only to say this: submit the evidence, but do not rely upon *hypothetical* physiological links in the causal chain. Where the links are hypothetical, their nature can hardly be beyond doubt.

Secondly, a good deal of interest attaches to the behaviorist's attempt at a mechanical explanation of the acquisition of motor habits by animals.¹² This is sufficiently interesting on its own account, although whether it has been successful is doubtful. But it is also interesting because of its wider significance. It would certainly be highly interesting if, in a certain case in which the interaction

¹² Cf. Watson's *Behavior*, Ch. VII.

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hypothesis has been deemed almost inevitable, it should turn out that this hypothesis is not necessary. If the behaviorist can establish that, he will have made a notable contribution to the principles of psychological explanation.

VII.

There remains one further question. The behaviorist is ready to admit that his theory is not established; indeed, he is generally modest concerning *the evidence* for it, and states that he is accepting it *as an assumption*, though a highly reasonable assumption. In face of this position, the obvious question arises: why accept *at all* as true what you do not positively know to be true? In life, no doubt, we must often act on probabilities; but in science the situation is somewhat different. The behaviorist seems to say in answer: I do not make this assumption merely to satisfy my need for believing something, nor for any *practical* reason whatever. It is, on the contrary, accepted merely as a *scientific hypothesis*: behaviorism, in short, is a *hypothesis*.

Now the great respectability of hypothesis in science may lead to the acceptance of this answer without much thought. Hence, the actual situation is likely to cause some surprise when it is realized what it is. It is, in fact, this: there is not the slightest *scientific* reason for making the hypothesis. There is not one of the many very interesting problems with which the behaviorist has concerned himself that could not have been investigated by a scientist who was an interactionist. For instance, it is not necessary to assume behaviorism in order to investigate the extent and character of the muscular and glandular reactions which accompany mental activity, the instinctive neuro-muscular coordinations of an infant, the range of visual sensibility; nor, indeed, for any other *scientific* purpose. If the behaviorist were however to argue that the meaning he attaches

to the statement that "behaviorism is a hypothesis only" is that "behaviorism is *probably true*," the answer must be: (1) that the first and fundamental proposition of behaviorism is clearly false; (2) that, concerning its second proposition, the truth or falsity of which may be considered undetermined, behaviorism has adduced no evidence to render it probable.

VIII.

The behaviorist may say (1) that he means merely that *he* is going to investigate behavior, as defined by himself, and will call his investigations psychological. Such a position gives rise to no controversy of a scientific character. Or he may say (2) that all currently accepted mental phenomena are identical with behavior. Such a position is definitely erroneous. Finally, he may say (3) that he will accept, *as hypothesis*, the view that behavior is explicable without reference to any phenomena currently recognized as mental. To which the reply is: there is no *scientific* reason for adopting this hypothesis.

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THE ELEMENTS OF CROCE'S AESTHETIC—A CRITICISM.

I have endeavored to show in a previous article¹ that a good deal of confusion attends Croce's presentation of logical principles. The distinctive characteristics of sensation concepts and thought are by no means definitely expressed, and the functions assigned to each at different phases in the course of experience are contradictory; while his classification of concepts is both logically invalid and untrue to actual facts. But Croce's whole work aims at forming a more or less complete philosophic system whose main divisions are essentially interconnected; it is therefore quite legitimate to consider his theories of aesthetic as these are affected by the inadequacy of his *Logic*; and although this reverses his own order of treatment, still he has himself united the two provinces so closely that the inversion is not material.

1. I shall consider first his twofold division of knowledge, together with the theory of intuition, sensation and concepts.

Sensation (in the *Logic*) is for Croce essentially cognitive²; a view which fully accords with his division of knowledge into the two familiar forms, intuitive and logical; and since nothing is more important in philosophic speculation than the primary definitions, his development of this dichot-

¹ *Journal of Philosophy*. XVII, 17.

² "Sensation must be conceived as something cognitive, as a cognitive act." *Logic*, p. 3.

omy demands most careful consideration. Its full expression takes the following form:—Knowledge either (*a*) is obtained through the imagination; is of the individual; of individual things; and productive of images; or (*b*) is obtained through intellect; is of the universal; of relations between things; and productive of concepts.³ This parallelism plainly implies that our knowledge of relations is obtained only through the intellect; an implication of the highest importance in view of later developments.

From this standpoint Croce next proceeds to emphasize the value and complete independence of intuitive knowledge, which, contrary to the generally accepted theory which subordinates it to logical knowledge, develops and persists without any direct support from concepts. For this view, as is well known, many weighty arguments have been advanced by various writers; but none, I think, have ever approached Croce's in feebleness and irrelevancy. He cites specific instances of intuitions which, he maintains, are thus wholly free from conceptual elements;—"the outline of a country; a musical motive; the words of a lyric."⁴ Surely no illustrations could more inadequately serve his purpose; for, being intuitions, they are necessarily the result of that form of knowledge which he has called intuitive; while all relations, on the other hand, must arise (with concepts) from logical knowledge. It at once follows therefore that from the objects of intuitive knowledge in question relations must be completely absent; but how can this be for a moment maintained? Relations, and extremely complex relations, are of the very being of a map, a melody, a poem; in the one case exact and involved spatial relations, in the others delicately balanced temporal, tonal and rhythmic; so much so indeed that all would serve equally well to

³ *Aesthetic*, p. 1.

⁴ *Ibid.*, p. 3. Cf. p. 14—"the contour of Sicily"; and contrast the much vaguer instances (p. 7) of "intuitions without space and time—a tint of sky and of sentiment."

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⁵ *Ibid.*
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support Green's theory of the relational character of reality; for the slightest relational disturbance is amply sufficient to destroy or at least distort their truth and beauty.

It is in fact very remarkable that such a position should be assumed by a writer who, like Croce, is here primarily concerned with Art rather than with knowledge. For it is surely a perfectly obvious truth that artistic mastery (whether this takes the form of talent or of genius) consists essentially in the power of divining and expressing true relations; and the fact that this capacity may appear, to those who do not possess it, to be instinctive or scarcely self-conscious does not alter its essential character. The devastating effects of a half-tone error, of a faulty tempo, of a superfluous foot in scansion, are painfully familiar to every amateur; and the entire course of aesthetic education consists in the struggle to acquire proper control over the relational elements of art. Croce indeed himself recognizes this (p. 16); but as he has already excluded relations, because of their logical origin, from intuitive knowledge, he is now forced to bring them in again; which he does by means of two further distinctions, vital to his whole theory, but here introduced almost as side issues.

The first of these is that the intuitions in question "may be intuitive facts without a shadow of *intellective* relation"; the second is that even if, and when, concepts are present, these "are no longer concepts. They have been concepts, but have now become *simple elements* of intuition."⁸ Both these qualifications of his original contention are all important; for the first raises the question—are relations also, like knowledge itself, of two kinds—intellective and (let us say) intuitional? Is it possible for intuitions to include relations which are truly such, although they are not conceptual, not universal, not intellective? Such a distinction

⁸ *Ibid.*, p. 3; italics mine; cf. p. 36—"knowledge by concepts is knowledge of relations of things, and those things are intuitions."

should surely have been placed with the other bases of the entire theory, rather than brought in as an insignificant allusion without any further elaboration. The second, again, when taken in conjunction with the treatment of concepts in the *Logic*, gives to the whole argument a course so markedly devious as almost to suggest that Croce's contentions arise *ad hoc* from his philosophy, instead of his philosophy proceeding from his reasoning. For we find in the *Logic* that concepts are expressly the work of thought, which derives explicit concepts from representations; the transformation is thoroughgoing, for "the appearance of the concept transfigures the representations on which it arises, making them other than they formerly were";⁶ the statement is distinct and emphatic, and in the absence of proof to the contrary, it is but reasonable to suppose that the concepts thus formed will persist as such. Here, however, we find the bare assertion, advanced without any grounds whatever, that when concepts become mingled with intuitions, they thereupon not only cease to be concepts but actually become "simple elements of intuition," to which they were previously diametrically opposed in character. One result then of the intermingling of intuitions and concepts is that the concepts cease to exist altogether, becoming merged in intuition. But when Croce's philosophy demands it, the consequence of this apposition is altogether different; for (p. 52) "the product of intuition placed in contact with the concept" is history! When therefore I draw the map of a country, the concepts and relations concerned in the resultant intuition are either not "intellective," or they have ceased to exist; but when I narrate its history, then the concepts persist as such and contribute their due part to the final result!

Croce supplements this radically faulty analysis of the

⁶ *Logic*, pp. 4, 18, 149. "Representation" is, with Croce, equivalent to "intuition."

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nature of knowledge and intuition by adducing two further specific instances of the contrast he desires to maintain. *I Promessi Sposi*, then, is intuitional, while Schopenhauer's work is intellective; and the only further explanation given of the difference is, that their purposes and results are different. But this mere citation of a difference which is after all patent to the most casual observation is in no sense an explanation; I account for very little by saying *e. g.* that the difference between machine guns and heavy artillery is that they fire different projectiles. All this is mere philosophical dogmatism, without a single characteristic worthy of serious epistemological argument.

It is equally impossible to reconcile the accompanying description of sensation with the functions that are assigned to it in the *Logic*. There (to repeat) sensation is essentially cognitive, and so operates as a true antecedent to thought itself.⁷ But when, in the *Aesthetic*, Croce desires to demarcate intuition from sensation, this becomes "formless matter" producing not cognition but "animality, whatever is brutal and impulsive in man." Even when this matter becomes assimilated by spiritual activity, it is only to become form—it "gives place to concrete form"; so that it is difficult to conceive any sense in which such sensational content can be said to be truly cognitive in any way prior to the distinctive functions of thought; for again (p. 12) sensation "does not change its quality according to its richness or poverty, operating alike in a rudimentary or in a developed organism"; surely its inherent incapacity and worthlessness from the point of view of cognition could not be more forcibly expressed.

Nor is Croce in the slightest degree less dogmatic and more illuminating as to the method by which this defective-

⁷ *Logic*, p. 3.

⁸ *Aesthetic*, p. 9.

ness of sensation is overcome. The difficulty, as is well known, is one of the most serious that epistemology has to face; indeed it is not, I think, too much to say that it has hitherto proved unsurmountable. This (in my opinion) is but the inevitable result of the general mode of presenting the problem. If we limit ourselves from the outset to sensation as merely subjective mental content, then it must prove wholly impossible to transcend our self-imposed barriers so as to attain knowledge in any true sense of that term.⁹ But however that may be, Croce himself makes no attempt whatever to solve the problem he has raised; he is content with the bare assertion that sensation is actually so transformed that knowledge, either intuitive or logical, is achieved. "The spirit does not obtain intuitions otherwise than by making, forming, expressing. Matter, conquered by form, gives place to concrete form. Elaboration of sensation is intuition. That which does not objectify itself in expression is not intuition."¹⁰ All this may of course be quite true; it may indeed, as mysticism, be extremely valuable. But it must be remembered that Croce has chosen to approach his subject from the philosophic standpoint; his aim, on his own showing, is the theoretic analysis of the whole development of knowledge and experience; and from this point of view, the best mysticism is after all but poor philosophy. What his subject demands from him, then, is not the bare assertion that this or that happens; but (what we very rarely obtain) good evidence that it does occur, together with some explanation of why or how it does so.

Consider in this respect *e.g.* that principle so fundamental to his theory of Art—the identity of intuition and expression. Its various statements are all equally emphatic:—"Every true intuition is also expression. It is impossible to distinguish intuition from expression. They

⁹ Cf. *Mind*. XXVII, pp. 311....and contrast *Aesthetic*, p. 21.

¹⁰ *Aesthetic*, pp. 9, 12, 13.

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are not two, but one."¹¹ But what is it, let us ask, that is thus expressed? To reply "intuitions" is plainly tautologous, for the two terms are identical; but if on the other hand it is a content of any kind—let us say idea or image or fact or object (Croce cites "intuition of a geometrical figure")—then the question—fundamental in epistemology if not in art—at once arises—How is this content, whatever its nature, formed or obtained? Again we cannot say by intuition, for this denotes "expression"—the expression therefore of some content which must have been previously formed; so that the whole problem of the advance within experience from formless material sensation to some higher content is left in complete obscurity, except for the vague assertions which I have just quoted; and to rest content with the statement that knowledge is obtained either "through the imagination or through intellect" is to bring back into modern philosophy the worst type of scholasticism.

It appears however impossible to ascertain, from the terms employed by Croce, whether intuition denotes a content or an activity. If it is identical with "expression" it must be activity or process; and in consonance with this we find (p. 13) "intuitive activity possesses intuitions." On the other hand we have elsewhere the explicit identification of intuitions with content of various kinds, as in the instances already cited (p. 3); to which must be added (p. 36) "Intuitions are, this river, this lake." The same ambiguity marks the reference to perception on p. 5, where "perception" may mean either the objects cognized, or the consciousness of those objects, which is of course an altogether different thing. So that Croce has here, like several other recent writers, failed to distinguish psychical or spiritual activity from the content or objects with which that activity is concerned; and thus the dilemma arises—If

¹¹ *Ibid.*, pp. 13, 14.

intuition means content, then it cannot be identical with expression; if on the other hand it denotes merely expressive activity, then the prior formation of the content that is so expressed is left unexplained; as would appear from p. 19, where intuition "is distinguished, as form, from psychic material"; but nothing is said as to how, or why, such material should lend itself to this bestowal of "form"; and this, from every point of view, is the crux of the whole problem.

A further complication follows from Croce's subjectivist position with regard to external or physical reality; for the intuition, as such, lacks the attribute of this form of reality, which must be explicitly conferred upon it by "the application of an abstract concept which is physical, or belonging to external nature"; and this again is not "a truly real reality, (but) a construction or abstraction of the intellect." Obscure as these assertions undeniably are, they certainly confirm Dr. Wildon Carr's opinion that "Croce denies or rejects the reality of the external world." Intuitions then must not only share the obvious defects of all merely subjective content, but must also fall within the scope of the problem of the origin of such content in its relation to "truly real reality."¹²

2. A further, and perhaps (from Croce's particular standpoint) a much more serious result of this rigid identification of intuition and expression, is that it cripples from the outset the author's theory of Art; for artistic ability, even when it becomes genius, loses all qualitative distinction from ordinary experience and becomes merely a question of quantity. Croce seems to revert here to the ante-Kantian position of Hume:—"intuitions are always of sensations and impressions. Art is the expression of impressions."¹³ Now Croce has previously asserted (p. 12) that so far as

¹² *Ibid.*, p. 397. *Mind*, XXIX. p. 208 and *loc. cit. ante*.

¹³ *Aesthetic*, pp. 21, 22.

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sensations are concerned no quantitative change whatever is of the slightest value; "sensation does not change its quality according to its richness or poverty"; its transformation (although it is never explained or described) is there held to be essentially qualitative—"a qualitative formal difference." If then the necessity of such a qualitative change is maintained in the case of sensations, there can be no *prima facie* reasons at least for wholly excluding it from intuitions and for restricting these (as Croce does) to a mere quantitative increase, which, when sensations are concerned, is of no value whatever. It follows therefore that the essential "complexity, complication and difficulty" which are the hallmark of artistry become mere matters of the quantity of intuitions, and further, of what these again are always based on—sensations and impressions. But to such a view there are two serious objections. In the first place it would seem to contradict plain facts of biography and history. Many unquestioned geniuses have passed through strikingly limited experience; their "sensations and impressions" have been, by comparison, of the very scantiest:—Wordsworth, Emerson, Keats, Francis Thompson and the blind seer Milton; not even Shakespeare's "impressions and sensations" account for his unrivalled eminence. And secondly, if genius is thus but a mere quantitative abundance of intuitions, then all work that is truly creative must be impossible; for the artist, no matter how he may juggle with the inner content of his spirit, can but reproduce this in one form or another; he can never see "the light that never was, on sea or land." "No one has ever seen" remarked some one to Turner, "any sunsets like that." "True" replied the painter; "don't you wish we could?"; Corot again ceased painting when full daylight revealed every detail. Croce, however, would seem to agree here with the critic; he would trace every work of art to an ultimate foundation in the mere quantity of actual

sensational and impressional experience, the only other possible factor then being "form,—taking possession of psychic material,—expression," (p. 19); a view which seems however absolutely impotent to account for creative activity,—

"Such gift allowed to man
That out of three sounds he frame, not a fourth sound, but a star."

Still pursuing the treatment of content, we find (p. 26) that this can never "possess some determinate or determinable quality. . . . it has no determinable qualities until transformation takes place. We know nothing of its nature." All the diversity of intuitions then depends here not upon content, but on form. As against this however, "it is the matter, the content, that differentiates one of our intuitions from another; form is constant," (p. 9); here differentiation is due wholly to the content, and the two passages appear to be directly contradictory; but the second seems to be supported by the statement—"intuition is distinguished as form from what is felt and suffered";¹⁴ for otherwise feeling itself is wholly lacking in distinguishable qualities, and we are forced to the conclusion that the entire province of feeling is (a) neutral and colorless, and (b) dependent for its differentiation upon some kind of intuition. But again, since all intuition is essentially expression, it would follow that all feeling and suffering without exception must lend itself to expression; whereas it is a matter of everyday experience that by far the greater part of our feeling is absolutely inexpressible in any way whatever; we can neither adequately describe it nor impart it to another; unless he also actually feels it, he must remain unconscious of it; and all aesthetic intercourse is restricted to the latest formed and most delicate and refined elements

¹⁴ *Aesthetic*, p. 19. It is obvious that both views alike add to the difficulties attending Croce's subjectivist ontology.

of the totality of the theory of psychology.

A passage draws before compared. There the never attempts the philosophy of vital force efforts."¹⁵ merges in in which objections (atom etc) Would so exclusive formulations concepts remain employ? to exist, a ordinary philosopher. "true philosophy concrete; regarded either to those if these ideas and when eternal nature abstract while "nature"

¹⁵ *Logic*,

of the total feeling content. Once again then Croce's artistic theory comes into direct conflict with the facts of psychology.

A parallel confusion marks the distinction which he draws between philosophy, science and art, when this is compared with the treatment of the point in the *Logic*. There the true philosophic concept, to which science can never attain, is at once concrete and universal. If science attempts to overcome this incompleteness it must "enter the philosophic circle, posit concepts such as the atom, ether, vital force, space. These are true and proper philosophic efforts."¹⁵ This general principle (that a complete science merges in philosophy) may be accepted; but the manner in which Croce applies this truth seems open to serious objections. For in what sense do the concepts cited here (atom etc.) differ from concepts that are purely scientific? Would scientists themselves admit that they possess this exclusively non-scientific character? And if science, in formulating such concepts, becomes philosophy, what concepts remain which the scientist, as such, is permitted to employ? Apparently none; in his distinctive rôle he ceases to exist, and must either content himself with the ideas of ordinary uncritical experience or become a professed philosopher. Further, the concepts here in question, being "true philosophical efforts," must be both universal and concrete; but how can ether and vital force *e.g.*, be regarded either as concrete or as universal in the sense given to those terms by Croce throughout the *Logic*? Surely if these ideas are not abstract that term has no meaning; and when again we turn to p. 397, we find physical or external nature there described as nothing more than an abstract concept, "a construction of the intellect"; so that while "nature" as a whole is abstract, its elements—atom,

¹⁵ *Logic*, pp. 46, 49. *Aesthetic*, p. 50.

ether and so on—are concrete and universal. Space, again, is here truly philosophic; how then, as in the *Logic*, can “triangle” be but an abstract and fictional pseudo-concept? Once more the two standpoints are plainly in absolute contradiction.

3. If finally we consider, as we are quite entitled to do, Croce's philosophy of human experience as a whole, we seem forced to the conclusion that it fails more completely to attain its ostensible object than any of the great historic systems which he so freely criticizes. For after all, wide as are the gaps which these leave in our knowledge, they do in some true sense of the word explain something; great as are the problems which still remain unsolved, we do really comprehend after studying them more than we did before; each thinker, with all his defects, does clear up some aspects of the whole development. But Croce only succeeds in appearing to do this by a *petitio principii* which is none the less actual because he is not himself conscious of it; for I would not be understood to question in the least degree either the sincerity of his attempt or the high value of his work on subjects which are, however, of but subsidiary importance. But the success of his theory of the development of the great provinces of experience is wholly illusory. It really explains in the end nothing whatever; on the contrary, each of the principal stages is, in its turn, employed to account for another, while the final result is then regarded as one chief original source of the very experience from which it itself arose; thus leading to nothing more than a fallacious and theoretically valueless circle of argument.

For although Croce divides knowledge into the two forms intuitive and logical, still he rests both of these on but one and the same ultimate basis—that is on intuition. He does not, like Locke, Kant, and (though less explicitly)

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Hegel, trace knowledge back to two different and independent sources, whether this difference be due to reality or merely to our ignorance;¹⁶ and unsatisfactory though this procedure must be, still it does safeguard those who adopt it from the ὕστερον πρότερον which in my opinion vitiates Croce's theory; for as soon as one of these two bases threatens to prove inadequate it always remains possible to take the leap to the other, even though our ideal should be to apply the maxim *natura non facit saltum* to our philosophy; for it is after all decidedly a leap in the dark. Croce, however, posits but one origin for knowledge—intuition, as the following passages plainly show:—"Intuitive knowledge has no need of a master; she does not need to borrow the eyes of others.—Having freed intuitive knowledge from every posterior and external adjunct. . . .—The aesthetic form is altogether independent and suffices to itself without external support. Expression can exist without the concept, but the concept cannot exist without expression." This priority and independence of intuition are exhibited again in its "purity":—"What can pure intuition mean, but intuition pure of every abstraction, of every conceptual element, neither science, history, nor philosophy?"¹⁷

Such then is for Croce the single ultimate source of all experience. Below this, it is true, somewhat in the same way as certain phenomena exist below the threshold of consciousness, we find impressions and sensations, sensational material, "mere matter"; but before this can at all enter into experience proper it must be transformed by spiritual or formal activity; although no explanation of this con-

¹⁶ Cf. Kant, *Werke*, VIII. 719. "The human understanding is not a faculty of immediate perception, but one of thought, which requires alongside of it, or as its material, a second quite different faculty or receptivity of perception." Hegel's treatment of the question seems to be a matter for argument.

¹⁷ *Aesthetic*, pp. 2, 8, 36, 43, 394.

version is anywhere given. Thus the problem becomes that of accounting for the whole development of experience, in its full diversity, from this sole intuitional origin. What now is Croce's detailed theory of this evolution? It is given partly in the *Aesthetic*, partly in the *Logic*.

(a). Turning to the *Logic* we find—but still without any explanation—that concepts are derived from intuitions (representations) by thought; they are of two kinds, which are produced only in the fixed order of true concepts, followed by the pseudo-concepts of both ordinary knowledge and science. "Conceptual fictions follow rigorous concepts and presuppose them as their own foundation,"¹⁸ while science "is composed of pseudo-concepts" which, despite their distinctive characters, fall logically within one category with the ideas of everyday life; and the development of science is always in a direction away from the concrete universality of the philosophic concept proper. Certainly both the genesis and the classification here outlined appear highly questionable,¹⁹ but let us accept them and observe the consequences.

For from the interaction between the primal intuitions and these later formed concepts there next arises history, "the product of intuition placed in contact with the concept, (which) presupposes the world of the imagination and the pure philosophical concepts or categories, and produces its judgments or propositions by means of the synthesis of the imagination with the concept." It is essential to note that the active and operative original concept here is that which Croce defines as "pure" and "philosophical," not any lower or simpler form from which philosophic concepts themselves may afterwards arise; on the contrary it is the pure concept itself, without any qualifications, which appears

¹⁸ *Logic*, p. 30; italics mine.

¹⁹ Cf. *Journal Phil.*, loc. cit.

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and is active at this stage—one of the earliest—in the whole evolution. The term "history" again has a very wide meaning, and the several accounts which are given of its complex formation are by no means of the clearest; it denotes "collections of things that have happened to men and animals, the earth or the stars. The world of history (includes) the reality called physical as well as the spiritual and human. All this world is intuition,"²⁰—in spite of the essential activity of the concept from which, as Croce has repeatedly insisted, the intuition as such is wholly free.

(b). The next step, following now the *Aesthetic*, is that this historic knowledge, the offspring of intuitions and pure concepts, becomes one of the indispensable bases of Science, the sole other being philosophy. "What there is of truth in the natural sciences is either philosophy or historical fact. What they contain proper to themselves is abstract and arbitrary. Natural sciences presuppose historical material. They submit this material to . . . abstraction and systematization."²¹ And so far, apart from any deficiencies of explanatory theory, there appears to be no fundamental logical defect in the course of the exposition; but with the next stage in the argument—at least so far as the *Aesthetic* is concerned—this certainly seems to arise. For if the historic-scientific knowledge, whose development has just been described, follows a further course it must itself become philosophy. "When the natural sciences wish to form themselves into perfect sciences, they must enter the philosophical circle, posit concepts anything but natural, (which) are true and proper philosophical efforts."²²

(c). Thus one (if not the sole) final result of experience is philosophy; but philosophy, definitely and specifically in the form of the pure philosophical concept, has al-

²⁰ *Aesthetic*, pp. 52, 384, 49.

²¹ Pp. 50, 384.

²² P. 50.

ready been postulated as one of the original sources of this experience; thus it appears first at the beginning as one of the origins, and also at the end, and in the same form of the true concept, as the result. The line of argument is certainly complete; but unfortunately it attains its completion only by turning back upon itself so as to form a fallacious circle. Philosophy, as one of the supreme ends of experience, has been accounted for only by being presupposed, with little explanation or none, at the earliest stages of development; it is at once therefore effect and cause, origin and result; and the theory, if it is to be taken as something more than a mere external description of the phenomena, finally explains nothing whatever in any real sense of the word; it merely at the most interprets the development in terms of itself, and thus approaches the sterile identity $A=A$.

Other considerations, based in part upon Croce's own principles, confirm this conclusion. The final philosophical concept must necessarily be identical with the original because, quite apart from Croce's explicit theory, no other source remains possible. For intuition is, always and essentially, free from concepts; history again, though it may utilize or incorporate them, itself never forms any; it "does not form concepts, does not construct universals or abstractions, but posits intuitions";²³ while science, as distinctively such, obtains its peculiar concepts only by modifying, distorting, or even falsifying the philosophic concept proper, which, it must be remembered, is prior to all other concepts whatever.²⁴ Again, philosophy, unless it takes the form which is popularly supposed to arise from the thinker's inner consciousness, must obviously rest upon data of some kind—historic, artistic, scientific—indeed on facts

²³ P. 44.

²⁴ *Logic*. pp. 45, 46, 89, 369.

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and principles of all sorts which are either not philosophic at all or at least not explicitly so. It is true that here the *Logic* differs from the *Aesthetic* in that the former excludes the possibility, recognized by the latter, of science merging in philosophy; on the other hand, the *Aesthetic* would on this point seem to agree the better with actual facts, whereas if the standpoint of the *Logic* is correct the consequence must be that one possible source the less remains from which philosophy can arise. But Croce either excludes such material data entirely from the scope of philosophy proper, or he derives them from intuitions together with concepts which themselves are essentially philosophic, and so leaves the problem without any true solution whatever.

4. And in quite another aspect—in relation now to Art and the artist—Croce's *Aesthetic* seems to be strikingly inadequate. I have alluded already to his reduction of the distinction between artistic and other experience to a difference that is never more than quantitative; but he appears further to cut Art completely off both from reality and from thought. For reality, the following passages are sufficiently emphatic: "Art is governed entirely by imagination; its only riches are images. Art does not pronounce (objects) real or imaginary. Art feels and represents them. Nothing more. Art. . . . uses the real, without changing or falsifying it. . . . apprehends it immediately, before it is modified by the concept. The content of the pure intuition cannot be either an abstract or a speculative concept, or a conceptualized representation. Nor can it be a perception (which) implies the application of an abstract conception."²⁵

It must be admitted that at first sight the closeness of the connection between Art and reality could not be more

²⁵ *Aesthetic*, pp. 385, 394, 397.

emphatically expressed than it is here; their interrelation is presented as immediate, without any change or qualification whatever; and it is only when this view, or rather the manner in which it is expressed by Croce, is considered in its bearing upon the nature of human experience as a whole that its shortcomings become apparent. For it seems to invert the actual and indeed the only conceivable mode in which experience develops; so that art in short is brought down to the level of instinct, or of some similarly automatic or non-self-conscious response to external stimuli and internal impulses, instead of ranking with the highest possibilities of spiritual endeavor and attainment. I do not suppose that this result is deliberately the aim of Croce's thought, in spite of his suggestion that art may be the lowest grade of the theoretic spirit.²⁶ None the less does it seem impossible to place it, as he does, prior to the explicit consciousness of reality, and then to treat this as but an additional or indeed extraneous modification which is wholly due to that Crocean negation of artistic activity, conceptual thought.

On the contrary, if we consider art, as it is only fair to do, at its more advanced stages and in the persons of its best exponents, its sole ultimate aim, its only explicit criterion, self-consciously chosen and pursued, is reality as such. Croce's contention may possibly hold of art in its earliest origins, whether historic or individual; of the simple savage adorning his cave, or of the child who, indifferent to actuality, depicts two eyes in the human profile; but even this can only be because consciousness as a whole is there undifferentiated, permeated by a universal simplicity; not because the pure artistic impulse is strong, and the abstract concept of reality undeveloped. Artistic activity doubtless possesses a quasi-instinctive character; but only a super-

²⁶ *Loc. cit.*, p. 384.

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ficial analysis can regard this as more than an appearance reflecting the observer's own limitations, and so lose sight of the elements of rejection and selection which are indispensable. That reality, then, with which art is in such immediate relation is never prior to the reality of perception, but is rather an advance on this, an elevation and transcendence of it. The artist does not rise to the level of perceptive and rational experience; rather he descends to it, from a mount of transfiguration;²⁷ he enjoys not a childish dream, but a divine vision. If great art is conscious—explicitly though perhaps not articulately conscious—of any end at all; if it purposely, though not reflectively, chooses and applies any standard whatever; that end and standard is reality. It is not of course, except for a worthless "realism," the pseudo-reality of everyday experience; but this is due not to the peculiarly conceptual character of that experience but to its comparative poverty and lack of intellectual value. It may not, again, be a reality that will stand the test of criticism; deeper insight may prove it to be imperfect or false. But that does not alter the fact that for the true artist the individual standard is reality as he conceives (or even imagines) it. The irresistible driving force which urges him on is the supreme reality of perfection, the sole justification of his effort and the only apology for failure. But Croce makes the artist to be first artist, and then human; his intuitions precede, or are separate from, his perceptions; so that he can turn from his perceptions and fall back on intuitions; which means in effect that he can at will deprive himself of his essential humanity and abandon his natural personality. And to assert that "art is in contact with reality, but does not know that it is so in contact and therefore is not truly

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I stand on alien ground.

Surveying awhile the heights I rolled from into the deep.

—*Abt Vogler.*

in contact," is to destroy the grounds of artistic inspiration.²⁸ It may be hypercritical to point out that an object, as object, cannot be felt; but no object appeals to an artist simply because it is an object, though it may so appeal to an amoeba. Art responds to an object because, paradoxical though it may appear, it is not an object; because it transcends itself, implying something more than what itself appears, and revealing, interpreting, something of the perfect whole that is hidden from the consciousness to which it is an "object." Thus art is always much more than passive feeling and representation; it is rather supremely active, creatively endowing the object that it "uses" with more or less of perfection, with beauty, sublimity, or grace.

Croce profoundly misreads then both the lower human and the higher artistic relation towards reality. His "intuition" is nothing but an abstraction, as are the "sensation" and "thought" of faculty psychology; it can not, more than they, be so isolated and separated from concrete experience as to form the material and basis of aesthetic, prior to and independent of all other elements. The consciousness, though not the explicit concept, of reality is original and primary, a matter of unreflective belief, the uncriticized basis of self and not-self; not even for the philosopher is it a question of applying a concept to some intuitional material which may itself on due occasion be held separately before the mind and as such used, felt or represented. This concept of reality arises from our experience of reality; but Croce reverses this natural order and so makes consciousness of the real the result of the concept.²⁹

²⁸ *Aesthetic*, p. 401. The entire section III may be compared. Contrast again *Abt Vogler*—

But here is the finger of God, a flash of the will that can,
Existent behind all laws, that made them and, lo, they are!

²⁹ "The perception of a physical object as such is not a pure intuition but implies the application of an abstract concept"; *Aesthetic*, p. 397. But obviously

And as with reality, so with thought; the connection indeed is inevitable. Certainly gradations and distinctions become apparent here which before were absent; but to divorce art from thought is to eviscerate it; most notably, perhaps, in poetry, although music, most emotional of all the arts, is also concerned. Profound thought is of the essence of great poetry. The dramatist, depersonalizing himself, depicts and expresses the whole personality—emotions, will and thought—of his characters; any play of Shakespeare's is sufficient proof of this; to question it is to deny history and life. "No man" says Coleridge—at once a competent critic, poet and thinker—the most penetrating critic Britain ever possessed, according to Richard Garnett,—“was ever yet a great poet, without being at the same time a profound philosopher.” The poet's thought, certainly, is quite other than that of the professed thinker; it flies and circles where the other plods and burrows. But to separate thought from art as decisively as Croce does—so that even “the distinctions made after reflection have nothing to do with art”³⁰—is to deny the organic identity of the larva with the butterfly.

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this is not on all fours with the naïve experience—“if I open my eyes and look at a mountain....”; it disregards an enormous advance in critical analysis. Cf. James, *Psychology*, ch. 21, and Emerson, *Michael Angelo*.

³⁰ Aesthetic, p. 32.

PARMENIDES AND AUTHORITY.

THE reason which seems to be given by Parmenides for his theory of being is that any other theory is inconceivable (R. P. 114). The same point of view certainly prevails in Zeno, who relies entirely on formal logic to prove his puzzles. But it is surely not revolutionary to suggest that this procedure involves the working hypothesis that the structure of the universe is like the structure of thought, that to understand the universe is to read into it the characteristics of human reason. That was easy enough when men were ready to admit that knowledge could only maintain between things which were alike, but it is a bit suspicious when men insist that the likeness between subject and object is irrelevant. Yet to argue that a body of propositions about an organic whole must itself be an organic whole, or that a single proposition can never be wholly true because its subject matter is never wholly real, is not very different from arguing, as Plotinus does, that we cannot know evil by any of our organs because our organs are all good, or, as Bergson does, that we cannot know what is dynamic by means of the reason because the reason is static. It is not dissimilar to saying that a body of propositions about unreal facts must be inconsistent or that knowledge of white objects must be white and of black objects black. To be sure if there is no legitimate distinction between thought and its subject-matter, if the two coalesce, these conclusions hold good.

As a matter of fact even the most self-conscious philosophers have read into their subject matter most of their own characteristics. Their tastes have become hypostasized and justified in the most extraordinary manner. The usual reader of philosophical literature hardly appreciates how inconclusive and dogmatic the great works of the philosophic temperament are until he had been enabled to speculate upon them without the books to comfort him and the libraries to bolster up his doubts. Service in the army, for instance, must have shown many students of philosophy that their subject is not so much a guide to life as a picture of life, that much more than lyric poetry is it expressive of individual personality. In the army one meets men who have never seen Burnet's *Early Greek Philosophy* and yet are splendid examples of the perfect Heracleitean or the Parmenidean. Indeed the very kernel of military discipline is the doctrine, "It is," about which there can be no dispute and no question. The army dogma necessitated by the practical needs of war has led military men to believe that in authority you have something—perhaps the only thing—which is substantial. Authority has all the earmarks of sovereignty. It cannot be changed from without, for in its universe it is all-inclusive. It may alter its visible form, but in reality it is immutable. It is blasphemy to seek its origin, for it has neither beginning nor end; it is; "nor will the force of truth suffer aught to arise besides itself from that which is not." If Parmenides had set out to write an accurate description of the authority of a commander-in-chief, he could have done no better than to have written his poem as it now stands.

It is not likely, is it, that people who had never dreamed of Elea should be eleatic, unless there was something in the work of Parmenides which was expressive of a fundamental and widely spread human attitude. One can go

into the expressions of men who have an interest in supporting authority and find eleaticism; one can go into eleaticism and find support for authority. What conclusions is one to draw from this except that metaphysics has a generous element of self-expression in it?

To be sure all philosophers will not admit all this. When they are empirical they maintain that they derive their opinion from facts; when they are rational, they maintain that they derive them from reason. These two weapons are almost omnipotent. They are too powerful, however, for they can justify almost anything.

As early as Plato the Eleatic qualities had become much more than the identification marks of substance, or Space, or being, or whatever it was they are supposed to identify; they had become the signs of great value. Whatever else the ideas were, they were the most worthwhile things in the universe, and it cannot be denied that they were Eleatic; for they were unchangeable (*Phaedo*, 78), "always the same, uncreated and indestructible," never being diminished nor increased (*Tim.*, 51). They were moreover substantial, meaning absolutely sovereign,¹ existing *χωρίς*. But these were exactly the characteristics which Parmenides had assigned to the subject of his *ἐστὶ* or could easily be read into them if one were anxious to find something in the world to which faith could be pinned with reliance. It was these qualities which made the ideas worth knowing and everything valuable (*Phileb.*, 67; *Tim.* 29). It is because both pleasure and the mind are wanting in self sufficiency and in adequacy and perfection that their claims to be the absolute good are disproved. It is because the world is the fairest of creations and that the creator is the best of

¹ See Zeller, *Plato and the Older Academy*, tr. by Alleyne and Goodwin, London, 1888, p. 240, n. 40, where the word "substance" is well defined as "generally anything subsisting for itself, forming no inherent part or attribute of anything else, and having no need of any substratum separate from itself." One can see from this careful definition how practical a meaning there was in the term.

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This type of philosophy was characteristic of Greek thinkers. With the possible exception of the philosophies of Empedocles and Democritus, all Greek philosophies, even that of Heracleitus, were a seeking after something permanent, stable, sovereign in its own right. Their *arche* was little more than something like the It of Parmenides. When we read in the histories of philosophy, "Thales said that water was the *arche*," ought we not to revise it to read, "Thales said that the *arche* was water." And this is what Aristotle did say in his account of his predecessors.² In the fragments of Anaximander, the similarity is especially interesting. It is complete except that Anaximander made his *arche* infinite, as every one knows, but his reason for doing so, says Aristotle (*Physics*, Bk. III, Ch. IV, 14), was that he believed it made the *arche* divine. He did not prove that the *arche* was infinite, nor did he discover that it was infinite; he wanted it to have all those characteristics which would dignify it in his eyes. Was it a different reason which made the Pythagoreans identify, as the traditional historians tell us, permanent and immutable mathematical relations with the *arche*? Windelband, in his *History of Philosophy*, seems to believe that their eternity, their immutability, their immobility, were sufficient proof of their metaphysical importance. They are the qualities which to a Greek apparently made life worth while, and hence they were the qualities of the *arche*. Who can give any *a priori* reason why the universe must be ultimately one or many, temporal or eternal, permanent or changing? Is not the reason in the long run likely to be that of Parmenides in the Platonic dialog named after him, "If a man fixing his attention on these and like diffi-

² But see Benn's *The Greek Philosophers*, London, 1882, Vol. I, p. 7, and Burnet's *Early Greek Philosophy*, 2d ed., London, 1908, p. 48.

culties, does away with ideas of things and will not admit that every individual thing has its own determinate idea which is always one and the same, he will have nothing on which his mind can rest; and so he will utterly destroy the power of reasoning, as you seem to me to have particularly noted" (*Parmen.*, 135).

At this point one is properly met with the objection that Heracleitus at least believed in impermanence. Yet he ordered his flux; the way up and the way down were the same (R. P., 36d); fire, the great destroyer, was itself eternal, "with measures kindling, and measures going out" (R. P., 35; Burnet, p. 148). This is a dynamic philosophy if you will, but it is a corrected dynamism. It may seem relativistic; but it has a fixed reference point. Whether or not Heracleitus's Logos had the connotation of the Stoics'—and they thought it had³—the most literal reading of the fragments shows us that the flux was definitely controlled by something from without, which was sovereign and independent of change. "The sun," he says in a well-known passage, "will not overstep his measures; if he does, the Erinyes, the handmaids of Justice, will find him out" (R. P., 39; Burnet, p. 149). The traditional interpretation of Heracleitus would make him out to be a denier of substance and permanence. Yet if the mutilated fragments mean anything, they mean that however dynamic the world is, something there is which directs its flow. No wonder he has been interpreted as the rationalizer of the Mysteries. His fragments might even be taken as tracts to reveal the Reason immanent and concealed in Irrational Nature, a sort of Hellenic Bridgewater Treatise.

It is not hard to see why the Greek philosophers with one or two exceptions sped so unfailingly toward whatever was permanent and reliable. From Thales to Aristotle

³ So does Benn, *op. cit.*, I, p. 24, and of course Windelband, p. 180. But see Burnet, p. 146, n. 3.

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these men were aristocrats. According to tradition Thales besides being an astronomer and geometrician, was the leader in a movement to federalize the Ionian Greeks and a monopolist in food stuffs. Of the semi-mythical Pythagoras we are permitted to believe that his order controlled the political power in Kroton. "The history of the Pythagorean order," says Burnet, "so far as it can be traced, is . . . the history of an attempt to supersede the State; and its political action is to be explained as a mere incident of that attempt" (*op. cit.*, p. 98).

A definite attitude toward society, and particularly toward that element for whom governments are sometimes said to exist, is first exhibited by Xenophanes. It is an attitude which runs through the later Greek philosophers including Aristotle. Driven out of his birthplace, a wanderer over the face of the earth, he finally found a refuge at Hieron's court. He was certainly no favorite of the people who, he said, honored the athlete at the expense of the philosopher, and who, in their ignorance, projected themselves into the personalities of their gods. The people and popular opinion became the two *bêtes noires* of the Greek thinkers, and when Plato came to write his *Republic*, one sees them merging in the body politic—its worst element.

Heracleitus's life is a sealed book, but he may be credited with royal descent and with having "resigned the nominal position of Basileus in favor of his brother" (Burnet, p. 144). His opinion of his fellow citizens is best expressed in the fragment, "The Ephesians would do well to hang themselves, every grown man of them, and leave the city to beardless lads; for they have cast out Hermadorus, the best man among them, saying, 'We will have none who is best among us; if there be any such, let him go elsewhere and among others'" (R. P., 296; Burnet, 154). His opinion of the people in general is not much

higher. "For what thought or wisdom have they? They follow the poets and take the crowd as their teacher, knowing not that there are many bad and few good. For even the best of them choose one thing above all others, immortal glory among mortals, while most of them are gluttoned like beasts" (R. P., 31a; Burnet, p. 154).⁴ Parmenides, the traditional antithesis of Heracleitus, "like most of the older philosophers, took part in politics; and Speusippos recorded that he legislated for his native city. Others add that the magistrates of Elea made the citizens swear every year to abide by the laws which Parmenides had given them" (Burnet, p. 195). The structure of his poem indicates what he thought of human opinion, although it says little enough about humanity at large.

Empedocles seems to have been more of a popular leader. He lived in troubled times in Sicily and certainly played a part in them. Burnet (pp. 230-231) gives two anecdotes to illustrate his method of dealing with tyrants and oligarchs, and ends this part of his account by saying, "He was offered the kingship which Aristotle tells us he refused. At any rate, we see that Empedocles was the great democratic leader at Akragas in those days, though we have no clear knowledge of what he did." It will be noticed that of all the Greek philosophers, the one who taught that human beings were but the accidental fitting together of odd arms and legs and other organs, and that monsters were as likely to have been produced as normalities, was the one popular leader. His philosophy was from the monistic point of view chaotic, a conglomeration of superstition, myth, observation, imaginative guesses, what not. He is hailed as the great charlatan of ancient times. And yet he is traditionally the great democrat. Benn, for in-

⁴ See Burnet's discussion of the three lives, p. 108f, "In this life there are three kinds of men, just as there are three sorts of people who come to the Olympic Games. The lowest class is made up of those who come to buy and sell, and next above them are those who come to compete. Best of all, however, are those who come simply to look on (*θεωρεῖν*)."

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stance, says of him, "[His verses'] speculative content exhibits a distinct decline from the height reached by his immediate predecessors. Empedocles betrays a distrust in man's power of discovering truth, almost, although not quite, unknown to them. Too much certainty would be impious. . . . We also miss in him the single-minded devotion to philosophy and their vigorous unity of doctrine. The Acragantine sage was a party leader (in which capacity, to his great credit, he victoriously upheld the popular cause), a rhetorician, an engineer, a physician, and a thaumaturgist. . . . Half-mystic and half-rationalist, he made no attempt to reconcile the two inconsistent sides of his intellectual character" (*op. cit.*, I, p. 27 *et seq.*). He is the one thinker of these times whose work is stubbornly pluralistic, and who seems almost to revel in the variety and diversity of his conception.

When we come to Anaxagoras we are back on familiar ground. We are told that both his and his father's names "have an aristocratic sound, and we may assume they belonged to a family which had won distinction in the State" (Burnet, p. 291). He went, we know, to Athens, not however because "he was attracted thither by anything in the character of the Athenians. No doubt Athens had now become the political center of the Hellenic world; but it had not yet produced a single scientific man" (*ibid.*, p. 294). He seems to have been brought to Athens to adorn the court of Pericles, much as Alcuin was brought to France to adorn that of Charlemagne. He was tried by the Athenians and "for the rest, the most plausible account is that he was got out of prison and sent away by Pericles" (*ibid.*, p. 297). Accounts, however, vary—even to the extent of saying on the one hand that he was sentenced to pay a fine of five talents, to saying on the other hand, that he was sentenced to death (*ibid.*, 297, n. 1).

The later Pythagoreans were no less active in politics

than the founders of the order. "In the fourth century the chief seat of the school is at Taras, and we find the Pythagoreans heading the opposition to Dionysios of Syracuse. It is to this period that Archytas belongs. He was the friend of Plato, and almost realized, if he did not suggest, the ideal of the philosopher king. He ruled Taras for years, and Aristoxenos tells us that he was never defeated in the field of battle" (*ibid.*, 319-320). The same is true of the Eleatics. "Like Parmenides and most other early philosophers, Zeno seems to have played a part in the politics of his native city. Strabo ascribes to him some share of the credit for the good government of Elea. . . . We hear also that Zeno conspired against a tyrant, whose name is differently given" (*ibid.*, 358). His fellow Parmenidean, Melissus of Samos, was a general in the army which defeated the Athenian fleet in 441-440 B.C. (*ibid.*, 369).

There is no need of going on with this catalog. Scarcely any philosopher has come down to us without some mention of his political connections. We have deliberately taken Burnet's account of these men's lives because it is at once the most sober and the most skeptical. One has only to compare it with Gompertz's to see how little he has drawn upon his personal imagination when it was not a question of omitting something. On the lives of Socrates, Plato and Aristotle it is useless to comment here. The broad lines are known to all, however doubtful the details. Socrates, not having been a metaphysician does not come into our discussion. Plato, after the death of Socrates, certainly felt no love for Athens and the Athenians. If the *Republic* is in any sense of the word a criticism of his city the last half of the eighth book ought to dispel any illusions a man might have about his faith in the people.

"Do you really think, as people are fond of saying, that our youth are corrupted by the Sophists, or that individual

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Sophists corrupt them in any degree worth speaking of? Are not the public who say these things the greatest of all Sophists? And do they not educate to perfection alike young and old, men and women, and fashion them after their own heart? . . . When they meet together, and the world sits down at an assembly, or in a court of law, or a theater, or a camp, or at some other place of resort, and there is a great uproar, and they praise some things that are said or done, and blame other things, equally exaggerating in both, shouting and clapping their hands, and the echo of the rocks and the place in which they are assembled redoubles the sound of the praise or blame—at such a time will not a young man's heart leap within him? Will the influence of education stem the tide of praise or blame, and not rather be carried away in the stream? And will he not have the notions of good and evil which the public in general have—he will do as they do, and as they are, such will he be?" (*Rep.*, 492.)

Such words are not the words of a democrat either in a theory or in practice. Like the expressions of his predecessors which are relevant and extant, they are the words of a social critic with a bias toward aristocracy. All of these men either despise the crowd, like Heracleitus or Xenophanes, or rule it, like Zeno. Empedocles alone seems to have cultivated it. But like the others, he expresses no love for its wildness, no pity for its ignorance. It is an enemy to order, a friend to change, to irrationality. The crowd in turn retaliates with banishments, fines and executions. It is in the relation of the philosophers to society that we find the best clue to their monistic predispositions.

As early as Thales's time Greek civilization was passing through what historians call gloomy straits. The myth of the passing of the Golden Age and the degradation of social values was being verified. The *Polykoiranie*, to which the staunch Odysseus objected with such vehemence was

being realized. The power of the one ruler to whom Zeus had given the scepter had passed into the hands of the nobles. Hesiod had written the record of his depression and Archilochos was adding his bitterness to the literature of this time.

Bury says of this period in his larger history of Greece,⁵

"At first the privileged classes of the aristocratic republics benefited by the increase of commerce; for the nobles were themselves the chief speculators. But the wealth which they acquired by trade undermined their political position. For, in the first place, their influence depended largely on their domains of land; and when industries arose to compete with agriculture, the importance of land necessarily declined. In the second place, wealth introduced a new political standard; and aristocracies resting on birth tended to transform themselves into aristocracies resting on wealth. The proverb 'money makes the man' now came into vogue. As nobility by birth cannot be acquired, whereas wealth can, such a change is always a step in the direction of democracy.

"On the other hand, the poorer freemen at first suffered. How heavily the transition from the old systems of exchange to the use of money bore upon them, we shall find illustrated when we come to the special history of Athens. But their distress and discontent drove them into striving for full political equality, and in many cases they strove with success. The second half of the seventh century (i. e., just before the Milesians) is marked in many parts of Greece by struggles between the classes; and the wiser and better of the nobles began to see the necessity of extending political privileges to their fellow citizens. The centralization in towns, owing to the growth of industries and the declining importance of agriculture, created a new

⁵ *History of Greece*, 2 vols., London, 1902, Vol. I, pp. 122 et seq.

town population and doubtless helped on the democratic movement."

Even in Sparta, which with its conservative constitution might have been expected to resist innovation, there was a growth of popular strength, and it is suggested that so apparently remote a thing as the introduction of light-armed infantry into the army was a step toward democracy, since it permitted the poor man as well as the rich to equip himself for battle (Bury, I, p. 136). Yet Sparta moved toward suppression of the new voices by running her house in the military manner.

"When Sparta emerges into the full light of history we find her under an iron discipline, which invades every part of a man's life and controls all his actions from his cradle to his death-bed. . . . As a city ruling over a large discontented population of subjects and serfs, she must always be prepared to fight. . . . Though the Helots were not driven by taskmasters, and had the right of acquiring private property, their condition seems to have been hard; at all events, they were always bitterly dissatisfied and ready to rebel, whenever an occasion presented itself. The system of Helotry was a source of danger from the earliest times. . . . and the state of constant military preparation in which the Spartans lived may have been partly due to the consciousness of this peril perpetually at their doors. The *Krypteia* or secret police was instituted. . . . to deal with this danger. Young Spartans were sent into the country and empowered to kill every Helot whom they had reason to regard with suspicion. Closely connected with this system was the remarkable custom that the ephors, in whose hands lay the general control over the Helots, should every year on entering office proclaim war against them. By this device, the youths could slay dangerous Helots without any scruple or fear of the guilt of manslaughter. But notwithstanding these precautions se-

rious revolts broke out again and again." (Bury, I, pp. 137f.)

It was the constitution of this State which Plato admired, living as he did, after the Periclean Age.

With the breakdown of monarchy and the rise of trade, with the consequent appearance of all that is ugly and distressing in commercial life, the loss of the regal manner and personal loyalty, which never fails to be touching even when wasted, the beauty of courts and courtly entertainment, came the new era when men grew uneasy at the sight of so much change. It was at this time when they began to inquire into its cause and to assume without question that beneath it all was some permanent substance on which they could base their hopes. It was as if they were sure that somewhere there was something enduring and reliable if only they could find it. Upon the tablets of Delphi had been engraved the words "Nothing in excess," and we are prone to look upon them as the devout expression of moderate men. And in a sense they were. But uttered in the late seventh century that serene and temperate air is lost, and they sound rather as a warning to a people moving too fast. It was as if they were sounding a halt to the impetuous flight from the old and tried toward the new and unknown.

That men felt the passing of things and the speed of change is evidenced—if not by the poets alone—by the codifying of laws. Throughout the ancient world almost simultaneously the lawgivers arose, Zaleucus, Charondas, Draco, Solon. It is in this movement that Bury sees the beginning of a "long political conflict" (I. p. 154), which resulted here in success for the democrats and here failure, with a predominant instability and swinging from democracy to oligarchical forms of government.

The great advantage of a codified law is of course obvious. Law which is admittedly only the opinion of a magis-

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trate varies in justice with the magistrate. We are prone to look upon the modern state's loss of sovereignty and the law's gain of it as a blessing for the governed.⁶ A written law, we feel, has lost its arbitrariness. That is indubitably true, but it has also lost its flexibility. A codified law is permanent; it is codified in order to be permanent; and it is improbable that the ancient lawmakers differed very much in their motives from the moderns. The laws of ancient Greece were not noted for their liberality. They were as much an instrument of conservation as of justice. No wonder then that the tyrants, who overthrew them, found an ally in the people. Bury (I, p. 155) seems to think that the people "were not ripe for taking the power into their own hands; and they were glad to entrust it to the man who had helped them to overthrow the hated government of the nobles." But it is hardly likely that any people ever surrendered rights and privileges because of a feeling of immaturity or inability. The desire for autonomy is usually a pretty effective balance for modesty. However unjustified the people may have been in their revolutions, the satisfaction of their demands has always necessitated the amendment of written law.

But such changes were naturally disagreeable to the aristocratic type of mind. One might venture to say that the most unpleasant feature of a tyrant was his friendship for the mob, the arbitrariness of his rule, the lack of consistency in his behavior, rather than his autocracy. But of course a tyrant must be inconsistent if he is to keep his power. For there is nothing consistent and fixed about human life except norms and as Royce pointed out to the satisfaction of Christians and Cynics alike, it requires an eternity to live out the life devoted to their cultivation. Machiavelli, it will be remembered, suggests that "a pru-

⁶ Cf. L. Duguit, *Law in the Modern State*, tr. by F. and H. Laski, New York, 1919, especially Ch. VII.

dent lord cannot and ought not to keep his word when such an observance would be contrary to his interests and the occasion of his promise is removed." But to a person who hates caprice and who moves restlessly in an environment which is fluid, such a situation is intolerable and such a rule loathsome. The philosophers of Greece were just such people.

The one Greek philosopher as we have seen above, who said nothing of this, was Empedocles, a demagog and a pluralist whose universe was controlled by love and hate. The one Greek philosopher who had no political connections, as far as we know, Democritus, was an atomist. But their philosophies practically died. The desire for the permanent, the stable, the something substantial and sovereign continued. It survived in all systematic metaphysics. It survived in Plato's ideals which were sovereign, eternal, immutable. It survived in Aristotle's substance. It survived in the Stoic and Epicurean Sages who were alone above change. Throughout the Middle Ages it practically made political science. It survived in the whole seventeenth-century conception of sovereignty and in the eighteenth-century conception of natural law. In the nineteenth century it began to appear as the characteristics of the written legislation and sometimes as the laws of science—"some call it evolution and others call it God."

But as a mere theory, a formal doctrine, like a system of mathematical propositions, it could never have acted as a spur to behavior. It must have been found consonant with someone's tastes, needs, ambitions, aspirations, what you will. To insist that men live the life eternal because they are Christians is not much different from insisting that some ape had to read the *Descent of Man* before the human race could evolve, or that only a thorough drilling in astral physics keeps the planets from colliding.

* *Il Principe*, ed. by L. A. Burd, Oxford, 1891, Ch. XVIII, pp. 300 et seq.

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The tendency toward the permanent, the Eleatic, is a sort of intellectual tropism which can no more be controlled by minds subject to it, than can the heliotropism of certain plants by the plants affected. It exhibits itself in all fields where a norm enters, which will be all fields where human beings come in contact with one another. The Church realized its importance almost in the earliest days of church history. The history of papal supremacy illustrates it perfectly and because most readers have few illusions about the Church, it will undoubtedly be admitted in this case at least that it was not so much a description of facts as the expression of a wish.

From the beginning of the Christian sects to the present day the Church has never existed as a unified body. It has had to fight schism and rebellion from the beginning of time. And yet Catholic doctrine as given in Denzinger's beautiful *Enchiridion* (p. 583) runs something like this. "The Church is a society instituted by Christ the Lord, constituting one body mystical under Christ as a head. It is a supernatural society, perfect and independent, visible and knowable from signs inherent in it, which distinguish it from other religious companies. It is a hierarchy, a monarchy, i. e., constituted under one head having the supreme power: it is therefore one, holy, catholic, apostolic; is necessary to all for salvation...and for the remission of sins; it is perpetual; to it was given the treasury of the merits of Christ...The Church is not divided in two, into carnal and spiritual, or into three branches, Roman-Catholic, Græco-Schismatic, and Anglican."⁸

One could make a perfect parallel between this and Plotinus's World of Ideas. They too are divine in origin, being the thoughts of the second person of his Trinity,

⁸ I have omitted Denzinger's page references by which he establishes each point.

the Nous.⁹ The World of Ideas is supernatural, existing above the world of sense. But it too is knowable. Just as Pius IX in his epistle "*Tuas libenter*" (*Enchir.* No. 1681) said that Catholics ought to have divine revelation as a guiding star before their eyes when engaged in natural science, so Plotinus teaches that discursive reason is good only up to a certain point; that after that point the soul should know intuitively. The Plotinian world is most decidedly a hierarchy from several points of view, dominated by the One. It has not the religious power of remitting sin for obvious reasons. But it was a unified group of individuals and a catholic group in which schism was as impossible as in the Church.

I do not mean to say that the Church is modelled upon the Plotinian universe. I wish to suggest that it is an expression of similar intellectual needs. From the formulation of the Apostle's Creed to the Fourth Session of the Twentieth Ecumenical Council tradition emphasized this. It emphasized what was eleaticism. It is repeated in creed after creed, "Especially do we believe in the one catholic and apostolic church." The uniqueness of the Church was declared as early as the sixth century when Pelagius II in his epistle to the schismatic bishops of Istria (*Quos ad dilectionem*) referred doubters to Matthew xvi where Peter is given the keys of heaven and ordained to be the rock upon which the Church will be built. But it was actually no more unique than it is now. In fact this letter was occasioned because of the existence of a schism. Yet the Pope was on the way to making it unique by damning and anathematizing those who thought or believed or presumed to teach against its uniqueness (*ibid.*). It was Plato's gesture of forbidding all but geometers to enter the Academy. Plato, however, never went so far as to prove the non-existence

⁹ Cf. F. Picavet's *Hypostases Plotiniennes et Trinité Chrétienne*, Paris 1917.

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of non-geometers by excluding them from his society. Of course there was the argument of self-preservation impelling Pelagius as it impelled his successors. So St. Nicholas I defended the Church's immunity and independence in his epistle "*Proposueramus quidem*" to the Emperor Michael, circa 865, with the proud words, "Neither by Augustus, nor by all the clergy, nor by kings, nor by the people, shall the judge be judged. . . . *Prima sedes non iudicabitur a quoquam*" (*Enchir.* No. 330). The Church had been given to Peter and there was no higher authority than the Apostolic See. Leo IX in his epistle "*Congratulamur vehementer*" (*Enchir.* No. 347) to Peter, Bishop of Antioch, in 1053, reaffirmed the holiness, catholicity, unity, and truth of the Apostolic Church. By the time of Callixtus II, who was pope from 1119 to 1124, the Ninth Ecumenical Council had decided that so independent, which meant self-dependent, was the Church, that neither prince, nor other layman, no matter how religious, could have a voice in her affairs (*Enchir.* No. 361). She was her own mistress; she was acknowledged to be sovereign.

It is then that she is completely eleatic and it is then that she can be admitted by all to be *semper eadem*, of which Mr. Laski makes so much in his essay on *De Maistre and Bismarck*, a fine example of the same philosophy in two men who were fighting for opposite ends. If that quality of immutability can be proved, it seems to be sufficient to win the obedience of all the members of the Church and an added proof of its authority and sovereignty. The more one studies the bulls, epistles, decretals and other pronouncements in the *Enchiridion* the more one sees the importance of this argument and its central position in the Catholic Faith. It is taken for granted, one might say, that a thing which is not susceptible to change is somehow more valuable than one which is. But one should never forget that the admission of change—an admission which

no pope has granted—involves perhaps the admission that the change is for some end, better or worse than the existing state of affairs, which would be ruinous. But it would be ruinous practically. There is undoubtedly a greater value attached by people to old and lasting things than to new and fleeting things. But has anyone to date been able to explain why? The proof the Church has usually advanced of her own permanence has been John xxi. 15 ff. But the value of that proof is again largely practical. Let us waive the question of whether any proof is any more than that.

The faith in the eleatic nature of the Church was repeated periodically throughout the years, although no new argument was adduced to substantiate it. It was repeated, for instance, by Innocent III in his epistle "*Eius exemplo*," in 1208, (*Enchir.* No. 423) as one of the admissions prescribed for the recantation of the Waldenses. It was reaffirmed under the same Pope's auspices at the Twelfth Ecumenical Council, 1215 (*Enchir.* No. 430).¹⁰ It was naturally emphasized in the Fourteenth Ecumenical Council which actually succeeded in unifying the East and West for a few years—nor was it renounced when they broke loose later—and was a special article of faith in the profession of faith proposed by Clement IV to the Emperor Michael Palæologus¹¹ which was adopted at the same council. (*Enchir.* No. 464; cf. 466). It reached a splendid climax when Boniface VIII took it seriously in his Bull "*Unam Sanctam*," of November 18, 1302.¹² The argument was

¹⁰ But at the same time Walther von der Vogelweide was hymning the same traits in his lord and master, Otto IV. See Luchaire's *Innocent III, la papauté et l'empire*, Paris, 1906, pp. 9f.

¹¹ See *Enchir.*, p. 201, n. 2.

¹² There is a dispute about this date. See Hefele's *History of the Councils*, French transl. by Dom H. Leclercq, Vol. VI, Paris, 1914, p. 425. The whole Bull is a matter of argument. For its authenticity see Hefele, *ibid.*, p. 427, n. 1; 428, n. 2. Also H. Finke's *Aus den Tagen Bonifaz VIII*, Münster, 1902, Ch. IV, esp. gloss., p. C. There is an apology for it worth seeing in the *Pouvoir du Pape au moyen âge*, Paris, 1845, pp. 569ff, by "M...., Directeur au Séminaire de St. Sulpice."

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given a new illumination by this most Hamiltonian of Popes, through setting it in the light of the Old as well as the New Testament. Does not Christ in the *Song of Songs* vi. 9) show the graces of the Church in the glowing words, "My dove, my undefiled is but one; she is the only one of her mother"? "She," says the Pope, represents "the body mystical of which the head is Christ." Furthermore, during the Flood, Noah had but one Arch, which had one helmsman; all else was blotted out. The Church is the seamless garment of the Lord. "Therefore, the one and only Church had one body, one head, and not two heads like a monster; Christ, and Christ's vicar, Peter, and Peter's successor, since the Lord said to Peter himself. 'Feed my sheep' (John xxi. 17). Mine, he said, and mine in general, not singularly these and those; by which he is understood to have taken to himself all sheep."

But at this point the Bull proceeds to derive some practical value out of it all. The Pope takes up the figure of the two swords, the spiritual and the temporal. It is true that there are two, one in the hands of the Church, the other in the hands of the kings and soldiers, *sed ad nutum et patientiam sacerdotis*. Therefore temporal power must submit to spiritual power, the king to the pope—something which Philip the Fair felt was hardly feasible. If the State, furthermore, err, she must be judged by the Church; but if the Church err, she can be judged by God alone.¹³ This is undoubtedly the height of the argument, for in it one has the presentation not only of all the eleatic qualities of the Church, but also of the consequences which follow. That which is single, immutable and self-dependent—sovereign—is supreme among societies and authorita-

¹³ See Gierke's *Political Theories of the Middle Age*, tr. by F. W. Maitland, Cambridge, 1913, p. 104, n. 9, for valuable material on this argument.

tive. The Church is hardly to be distinguished from the Plotinian One.¹⁴

None of the popes have explained why that which was eleatic should exact obedience, and one would be hard put to it to give any good reason for it. It is simple to understand why that which wishes to exact obedience and associated values should attempt to prove that it is eleatic. It is the sort of thing one finds in all systems where devout allegiance is demanded from "Thou shalt have no other gods before me" to the days of "*Deutschland über Alles*." It is only proper that a king should deny the existence of other possible kings; or that a supreme God should deny the existence of other gods. Having proved uniqueness, it is an easy step to eternity and to immutability. For all the eleatic qualities are highly useful in preventing the dissipation of power. Dante in his *De Monarchia* (Bk. I, ch. 5)¹⁵ invites attention to the proverbial curse, "May you have a peer in your house," which he poetically interprets as the imposition of an unnatural and hence base situation on the ruler. From it he easily argues for a monarchy. It is a simple matter after that, by an obvious and thoroughly Platonic abstraction, to treat the unity as the important point and the thing unified as unimportant. What this type of mind could do is better illustrated in the ninth chapter. The good son, Dante reasons, should follow his Father. Man is the son of Heaven; therefore he should

¹⁴ Between Boniface VIII and Pius IX little is done about the Eleatic qualities of the Church except the Bull "*Cantate Domino*" of Eugene IV, Feb. 4, 1441, esp. *Enchir.* No. 714; and the Bull of Pius IV "*Iniunctum nobis*," Nov. 13, 1564, esp. *Enchir.* No. 999.

Under Pius IX, see his encyclical to the bishops of England, Sept. 16, 1864, against the Society for Procuring Christian Unity; his encyclical "*Etsi multa luctuosa*," Nov. 21, 1873; the allocution "*Luctuosus exagitati*," March 12, 1887. In Pius IX no one will admit that the arguments are purely theoretical.

His successors have not relinquished the argument. See Leo XIII's encyclical "*Satis cognitum*," June 29, 1896, and his epistle to Cardinal Gibbons, "*Testem benevolentiae*," esp. *Enchir.* No. 1975ff, which condemns the idea of an American Church. Add to this Pius X's decretal "*Lamentabili*," July 3, 1907, directed against the Modernists, esp. Arts. 53, 56, 58, 60, 65, and the matter is brought fairly up to date.

¹⁵ Eng. tr. by Philip H. Wicksteed in the *Temple Classics*, p. 140.

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follow Heaven. But all the Heaven is governed by a single motion and a single mover, the *primum mobile* and God. It follows then that mankind should be governed by a single prince as the single mover and a single law as the single motion. Hence there should be one emperor for the whole world.

Dante has a sort of reverence for unity. "Being," he says, "naturally precedes 'oneness' and 'oneness' naturally precedes 'good'; for that which is most existent is most one, and what is most one is most good. And the further anything is removed from the supremely existent the further is it removed from being one, and therefore from being good. Therefore in every kind of things, that is best which is most one. . . . Whence it comes about that 'being one' is seen to be the root of 'being good,' and 'being many' the root of 'being bad'¹⁶. . . . Hence it may be seen that sinning is naught else than despising and departing from 'unity' and seeking multiplicity. It is clear, then that everything which is good, is good in virtue of consisting in unity" (*Ibid.*, Bk.I, Ch. 15). How easy it is then for him to argue that we must have a unity of wills, and that that can come about only by the domination of one will, which is that of a single prince. "Now," he concludes, "if all the above deductions are sound, which they are, it is necessary for the best disposition of the human race that there should be a monarch in the world, and therefore for the well-being of the world that there should be a monarchy" (*Ibid.*).¹⁷ This type of reasoning is hopelessly medieval, one will say, and yet its imaginative character is even excelled by that of some more recent writers.

Is not Bluntschli's analogy between the state and a

¹⁶ Cf. the Abbé Lantaigne in Anatole France's *L'orme du mail*, pp. 214 et seq.

¹⁷ The translator here gives a suggestive reference to the *Paradiso* "in which the whole universe is depicted as a unity."

living organism as fantastic?¹⁸ He says he will not consider the food-hunting and digestive proclivities of animals, nor their power of reproduction. He is content with the following, (a) their being a combination of soul and body, (b) their forming a whole whose organs have proper functions to fulfill in order to satisfy the vital needs of the body, (c) their organic growth. This would be a mere figure of speech, were it not that Bluntschli actually utilizes it as an argument. In his discussion of the relation of Church to State, e.g., the Church is feminine, the State masculine. Hence the Church can have no sovereignty nor would she wish any; she merely wishes to serve God and perform her religious duties—which throws light on the German idea of female character as well as of politics, (*Op. cit.*, p. 23).¹⁹ No one could object to this if it were merely figurative language, but to Bluntschli at any rate the metaphor loses its metaphorical value and is treated literally.

Whatever may have been Dante's reason for his worship of unity, assuming that he had reasons, Bluntschli's could easily be traced to the desire for a German empire. When he begins to argue against the liberation of women (Ch. XX) one sees more than the theorist, one sees the strong father and master in his own house. First, he says, the universal usage of civilized peoples is against equal rights; second, the feminine nature, the sweet virtues of wife and mother, would naturally suffer from the toil and travail of politics; third the virile nature of the State would be corrupted; fourth, the passive moral forces would be

¹⁸ *Lehre vom modernen Staat*, Stuttgart, 1875, Vol. I, p. 19.

¹⁹ Human beings have always looked upon the State as a sort of super-human being with anthropomorphic traits. Every one knows that it goes back to the *Republic* at least (Bks. III, IV, V), and I venture to suggest that it survives in our constitution with its separation of powers into executive, judiciary, and legislative. I have not been able to find in a hasty reading of Montesquieu made for another purpose an avowal of this analogy, but one who knows faculty psychology would have no trouble in constructing it for himself. The point is that whenever we deal with single things, whenever we handle individuals, we read into them the traits of the human individual. The evolution of Aristotle's Substance into Jehovah is a case in point.

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increased, the active weakened, since women are more impressionable than men. Finally, it is one of the provisions of public law "especially among the German people that the wife is made a participant in the political honor and majesty of her husband. There lies therein a recognition of the true indirect relation of the women to the organism of the State, and a worthy substitute for the participation in properly political rights denied them" (p. 234). Again in his theory of the birth of states through *organische Staatstrieb* and *Staatsbewusstsein*, he shows himself much more than the political scientist in his abundant love for the existing order. His theory, much like Dante's is optative rather than indicative.²⁰

But we must reserve a discussion of eleatic theories of the state for another moment. Like the excerpts from the papal pronouncements, Bluntschli and Dante simply serve here as examples of the same temperament. The lesson is for the student of philosophy. Philosophy becomes a very curious activity if it is a type of self-expression which consists in reading into the universe either one's own ambitions or one's own actual character. Criticism of philosophy in that case would be more closely akin to criticism of art than of science—a conclusion that a man like Croce would probably welcome. Even Fouillée with his notion that the philosopher seeks "the totality of possible experience"²¹ believes that the constructive part of philosophy is essentially artistic. "But," he adds justly enough, "he, [the philosopher], ought never to confuse his divinations with his inductions."

The logic of this type of philosophy is Ribot's *logique des sentiments* rather than his *logique de la raison*. Indeed

²⁰ See in particular Bk. V, Ch. 4. As Professor Coker rather plaintively remarks, "The value of such a system as an illustrative expedient would depend on its appeal to an imagination of a similar type to that of the artificer's."—*Organismic Theories of the State*, New York, 1910, p. 198.

²¹ *L'avenir de la métaphysique*, Paris, 1890, Pt. I, Ch. 5, pp. 79ff.

Ribot believes that that is just what it is. He shows to his own satisfaction that the impulse toward metaphysical imagination is a need of *total explanation*. "It is not an attempt made upon a limited group of phenomena, but a conjecture about the ensemble of things, an aspiration towards completely unified knowledge, a need of final explanation, which for certain spirits is as compelling as any other. This need expresses itself by the creation of a cosmic or human hypothesis, constructed ordinarily according to the type and procedure of scientific hypothesis; but which, radically subjective in its origin, is objective only in appearance. It is a rationalized myth."²² This is no disproof of metaphysical theories; it is obviously merely an explanation of their genesis. And in his *Logique des Sentiments*, Ribot points out clearly how valuable they are. The logic of feelings may not discover what is known as the truths of the reason, but it effects its end more serviceably and loyally than the reason itself. That is why the law of contradiction has so little place in the formulation of metaphysical systems. I omit a discussion of where it has a place.

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²² *Essai sur l'imagination créatrice*, Paris, 1900, pp. 210f.

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THE REQUIREMENTS OF AN ADEQUATE NATURALISM.*

THE aim of the present investigation is to work out in a systematic fashion the possibility of an adequate naturalism. The time has come for a persistent effort to throw the scientific and philosophical insights of the last generation into an organized whole. If I am not much mistaken, the period of systems is again dawning for philosophy; systems, however, founded upon the careful integration of knowledge with criticism. I would not be surprised if something of finality resulted from the controlled speculation that is now feasible. At no time in the past have the materials and instruments of philosophy been so rich and carefully fashioned. A master mind has an opportunity for interpretative synthesis never before equaled. Surely before long the outline of an adequate world-view will be achieved.

That this coming world-view will be of the nature of an evolutionary naturalism is the thesis of the present work. I shall point out the main problems to be solved and accompany this indication of problems with pretty systematic attempts at their solution. Nowhere shall I willingly resort to ambiguity and equivocation. The problems of philosophy are, to my way of thinking, as specific as those of the special sciences.

*[In the following pages we present the introductory chapter of Mr. Sellars's book on *Evolutionary Naturalism* which the Open Court Publishing Company will bring out in the spring. A few other chapters have appeared in *The Monist* previously. Ed.]

Philosophy, like science, is a human achievement, and so rests upon man's capacities. Unlike science, philosophy is forced to consider those capacities and processes which make it possible. It is for this reason that philosophy is necessarily so engrossed with man. Knowledge is a human affair even though that which is known is distinct from the knower. But man is a part of nature, and so these capacities and processes operative in science and philosophy must find their natural explanation. Intelligence must be given its locus and attachments. In other words, science and philosophy are properties of man. To explain them, we must comprehend man's capacities and his place in the world. The final problem of philosophy is to connect the fact and content of knowledge with its conditions. How does knowing occur in the kind of a world that is actually known? Knowing is a fact and must be connected up with the world which the sciences study. Thus a system of philosophy answering this question is the keystone of science.

If this is the case, it is not strange that the possibility of an adequate philosophy waited upon the advance of the special sciences. The biological sciences had to be added to the inorganic sciences before the data for the solution of philosophy's problem approached completeness. The next task was to bring the mental sciences into such close contact with biology that the operations they bore witness to could be seen to be rooted in the organism. Only as this grounding of mind in the body became demonstrably evident did the conditions of a satisfactory philosophy exist. Only then did knowledge become, itself, a natural fact correlatable with all other natural facts. Philosophy is the science which explains the other sciences as human achievements, and thereby completes science.

As we pass from problem to problem, we shall see that

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the two great enemies of an evolutionary naturalism are *Platonism* and *Kantianism*. Both deny this self-explanatory character of nature. In a sense, they are both supernaturalistic.

Naturalism stands for the self-sufficiency and intelligibility of the world of space and time. Supernaturalism maintains that this realm is not self-sufficient and that it can be understood only as the field of operation of a spiritual reality outside itself. Historically and logically, naturalism is associated with science, while supernaturalism is the expression of an ethical and religious metaphysics.

The great difficulty confronting naturalism has been the inclusion of man in nature, an inclusion that would do justice to all his distinguishing characteristics. An adequate naturalism must not belittle man in order to press him into some rigid scheme. It must not be *a priori* in its methods and assumptions, but work creatively upon all that can be known about all phases of nature. To-day the naturalist has no excuse for little faith.

We have suggested that supernaturalism is the antithesis of naturalism. If naturalism stresses the self-sufficiency and intelligibility of nature, it can be defeated only by demonstrating the insufficiency of nature. In the past, theological speculation sought to prove the rational need for some primal source beyond nature, for a Necessary Being upon which the contingent world could be grounded. As is well known, the analyses of Hume and Kant gave pause to this direct and assured refutation of naturalism. The three proofs of scholasticism, the cosmological, the ontological and the teleological, were shown to contain assumptions which had small measure of plausibility when critically examined.

But Kant himself suggested a more subtle and indirect way of approach than that of the confident scholasticism

of the precritical period, namely, an appeal to inner convictions or demands of the moral and religious self. But can man's life be divided by a hatchet into two compartments in this easy fashion? *Any semblance of plausibility in such a division was due to the Kantian disposal of the physical world as phenomenal.* Only because nature was more or less illusory could beliefs conflicting with the tide of natural fact retain their prestige.

Now as time passed, ethics and, with it, the theory of values were swept into the current of empirical investigation. English utilitarianism, evolutionism, a broader study of social facts, a more adequate psychology, all these new elements undermined the innate practical reason on its own ground. Psychologically and ethically, man was becoming a part of nature, comprehensible only genetically and biologically. The Kantian dualism between the theoretical and the practical reason no longer sounded relevant to the facts of human life. Man was a very complex whole immersed in and functioning in nature.

The strength of this more subtle attack upon naturalism lay, then, in two things: (1) its denial of physical realism, and (2) its assertion of a contradiction between determinism and empirical freedom. These two motives run through the opposition to naturalism characteristic of the nineteenth century. Idealism maintains, on the one hand, that physical nature is a realm of causal determinism and so contradicts man's freedom; on the other hand, that nature is a construction and not an independent reality. An adequate naturalism must meet both of these contentions. It must demonstrate the validity of physical realism as an epistemology and point out the possibility of reconciling causality with empirical freedom.

Naturalism has been given many meanings in the course of this age-long controversy. Most of these meanings

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have been slightly derogatory. The reader must, therefore, be on his guard against the application to the evolutionary naturalism forming to-day of interpretations which were in a measure those of the older, less adequate naturalism of the past. The ethics of modern naturalism, for instance, are by no means those of a crude Darwinism. We belong to a generation which has realized that, while man is an animal, he is not a brute.

Those who attack naturalism usually forget its larger setting and significance. They are not trying to save naturalism from injustice to itself but to destroy it for the greater glory of some view more kindly to supernaturalistic beliefs. Hence, we find naturalism identified without a remainder with naive materialism, positivism, agnosticism, the mechanical view of nature, etc. The weaknesses of past formulations were taken as conclusive for the basic fallacy of naturalism itself. But were anti-naturalistic positions any less open to criticism? The truth is that a secret animus was at work. But cannot the thinker examine these fundamental questions with the candor and objectivity of the best type of scientists?

In my own thinking, I have always hesitated to identify naturalism with naive materialism, positivism, the mechanical view of nature, or the bias of the physicist to reduce the whole world to facts of physics and nothing more. Has not the time come for the attempted formulation of a more adequate naturalism than those of the past? For a philosophy giving due weight to all the sciences and to the various sides of man's actual nature? The formulations of naturalism have often been narrow and harsh, while the demands of supernaturalism have been sentimental and exaggerated. The warfare between naturalist and anti-naturalist has resembled that between mechanist and vitalist in biology. While vitalism has gained little headway

as a doctrine, it has prevented scientists from falling too completely into dogmatic slumber. But surely the time is becoming ripe for a step beyond the sharp contrasts of the past into a broad and sympathetic empiricism.

The Spirit of Naturalism and Modern Science.—The following characterization of naturalism is true to its spirit: "At first tentative, but becoming ever more distinctly conscious of its real motive, naturalism has always arisen in opposition to what we may call 'supernatural' propositions, whether these be the naive mythological explanations of world-phenomena found in primitive religions, or the supernatural popular metaphysics which usually accompanies the higher forms. It is actuated at the same time by one of the most admirable impulses in human nature—the impulse to explain and understand, and to explain, if possible, through simple, familiar and ordinary causes."¹ The spirit of naturalism would seem to be one with the spirit of science itself. And many formulations of naturalism have been the products of the speculatively inclined scientist in his moment of indulgence in far-reaching generalization.

The specialist works in his own field in accordance with the technique which he has inherited and refined. His is the task to secure data that will help to solve specific problems; and his views are often the reflections of his methods and habits. Yet if he is a man of keen curiosity with some natural bent for wider thought, he will sooner or later formulate views concerning the larger relations of things. In short, he will assume the role of philosopher and interpret fundamental questions in the light of the concepts and data with which he is familiar.

But these concepts and data are not necessarily *sufficient* for the foundation of an adequate naturalism. How could

¹ Otto, *Naturalism and Religion*, p. 18.

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the physicist expect to do justice to chemical processes? Or the chemist to biological phenomena? Or the biologist to social institutions? Yet the specialist on his philosophical adventures is only too prone to postulate not only the truth of his categories but their sole sufficiency for all the problems confronting the mind. As against such an assumption, we shall argue that *all* the sciences contribute to the solution of ultimate problems. To attempt to solve the basic queries as to the nature of life in the light of physics alone is to challenge failure or a resort to sophistry.

Modern science has worked in favor of naturalism more successfully through the implications of its results than by means of wide-reaching speculation. It is the direction of the drift of the complex movement that is sensed. Hence, I shall be compelled to be rather hard upon the inadequate speculations of the older generation of thinkers even while sympathetic with their purpose. The time was not ripe for a philosophy of nature.

Two Common Forms of Speculative Naturalism.—Let it be borne in mind that we are not denying that science leads inevitably to some critical form of naturalism. The arguments of this book will show clearly enough that I believe that an adequate naturalism can be worked out. What we are suggesting is that the interpretation of the results of science is a far more difficult undertaking than has at times been realized. Consciousness, for instance, must be gotten into nature in a specific way in connection with the mind-body problem and not by throwing it into nature in a lavish and wholesale fashion. The two common forms of naturalism which we shall briefly discuss represent two stages which do not seem to come up to this critical level. The second form, positivism, comes nearer to this ideal than does naive materialism, the first form.

Naive materialism is a form of naturalism which has

played a very important part in the history of thought. It is often now carelessly thrown aside with the remark that we know too much about matter now to take it seriously. I am not so sure of the truth of this statement. The newer views of matter are far more subtle than the views of a few generations ago. But I must admit that it is seldom easy to know the exact idea of the physical world held by either materialists or anti-materialists. Both are stronger on assertion than on exposition.

The older materialism declared that physical reality consists of matter and motion. The notion of matter was probably that of the science of the period—hard particles affecting one another by contact. Just what the stuff of these particles was conceived as being I cannot make out. In short, it seems to me that this older materialism was largely the generalization in an uncritical fashion of the dominant mechanical view of the world. And just because it belittled such grave questions as those presented by life and mind or else had inadequate conceptions of these realities, it did not fulfil the conditions of an adequate naturalism. Naive materialism never realized the importance of epistemology. How do we come to know matter? The world we see is clearly a sensuous world; the world of matter in motion is an abstract, conceptual world. By what right do we pass from the one to the other and declare its superior validity? It would seem that the materialist of the uncritical type passes to a schematized vision of the physical world much as the interested reader uses words as mere symbols of meanings. He tends to give scientific concepts a vague ontological existence as intuitions of the very stuff of physical being. I frankly confess that it is not always easy to do justice to naive materialism just because it is not philosophically articulate. I think that it was Royce who said that the materialist was the thinker who believed that all phenomena could be expressed in terms of

differential equations of the second degree. There is a large measure of truth in this characterization. The scientist is only too apt to exalt his science's formulas and to make them universal. The materialist is the naturalist who reads nature in a limited way and believes that he has exhausted its possibilities.

I frankly recognize that there is a measure of arbitrariness in this description of materialism. It is a term which, after all, has no univocal meaning. For some, it means little more than naturalism as a sort of faith. They would reject any but the most modern ideas of matter and energy. Yet I think that materialism can rightly be associated with a certain degree of epistemological simplicity and with a tendency to reduce higher natural processes to lower without a remainder.

Scientists who have given themselves to speculation often temper their physical realism with agnosticism and animism. Thus Büchner argues that matter and force are inseparable. "There is no force without matter—and no matter without force." The stuff of the universe is dynamic. Matter is that which *manifests* itself in the various energies of light, heat and motion. These energies are measurable, but that which lies back of them is *unknowable*. But just because matter is unknowable, it can be endowed with all sorts of potentialities. It can be endowed with intellectual force as well as with physical force. It is noticeable that Spencer, although far more sophisticated, argues in much the same fashion that force is an unknowable source for all the phenomenal effects we experience. "By the Persistence of Force, we really mean the persistence of some Cause which transcends our knowledge and conception." Spencer's looseness of thought has been so unsparingly exposed by Ward that it is hardly necessary to go over the ground again. It should be noted that there is an unbridgeable gulf between our experiences and this

unknowable, and that persistence means alternately quantitative constancy and permanence of being.² Haeckel is another example of the militant scientist on speculation bent. The following quotations give some idea of his daring generalizations. "The two fundamental forms of substance, ponderable matter and ether, are not dead and moved only by extrinsic force, but they are endowed with sensation and will (though, naturally, of the lowest grade); they experience an inclination for condensation, a dislike of strain; they strive after the one and struggle against the other." "Attraction and repulsion seem to be the sources of *will*—that momentous element of the soul which determines the character of the individual." Haeckel is obviously fighting for continuity. *But is continuity of an evolutionary type opposed to novelties?* There is another feature of this naive naturalism to which attention must be called. The experts in other fields are rather despised. Thus he pays his respects to psychologists after this fashion: "Most of our so-called 'psychologists' have little or no knowledge of these indispensable foundations of anthropology—*anatomy, histology, ontogeny and physiology*. . . . Hence it is that most of the psychological literature of the day is so much waste-paper."

What shall be our comment upon these analogous forms of materialism? I think that our chief criticism must be that matter and energy become unknowables to which are assigned in a verbal way just those capacities which are necessary to meet unpleasant problems. What explains everything in this enigmatic fashion explains nothing. The intention is in a way commendable. Reality must be of a sort to account for the world as we experience it. Yet the connection between reality and experience is of the slightest. Philosophy becomes unanalytic and vague, a series of

² Cf. Spencer, *First Principles*, sec. 191, stereo. ed., p. 552; and James Ward, *Naturalism and Agnosticism*, 4th ed., p. 213.

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assertions which are not explanatory because knowledge of the unknowable is contradictory. Can the unknowable evolve and acquire new properties? Or is it always and everywhere alike in a static and dead-level way? The familiarity of the terms used suggests a directness and specificity which they do not possess as metaphysical symbols. We swing back and forth between scientific realism, for which matter and energy are determinate entities, and a vague agnosticism in which they are postulated as sufficient reasons for whatever occurs in the phenomenal realm.

The shortcomings of these uncritical forms of naturalism led scientists, better acquainted with the history of speculation, to develop various forms of *positivism*. There may, or may not, be a reality outside the reach of experience, but science affords us the only valid knowledge we can attain. The methods of the physical sciences have justified themselves by their results. Here are data co-operatively found and recoverable; here are empirical laws stating invariable relations between terms. This information satisfies the intellect and guides human behavior in successful ways. What more can be desired? The aims of metaphysicians are illusory. There are no things-in-themselves, no substantial reality of a transcendental kind. Terms like matter and energy and force should be kept to their analyzed, empirical meaning; for they are merely concepts descriptively useful in the organization of experience.

These positivistic forms of naturalism when examined in detail in the writings of Pearson, Mach and Poincaré show how dependent a naturalistic philosophy is upon theory of knowledge. Although securing much of their prestige from their standing as scientists, they plunge immediately into psychology and logic. Pearson becomes a Humean sensationalist. Mach seeks to establish neutral entities or elements which are physical and psychical according

to their relations. Poincaré attempts to justify science by demonstrating the exactness of its results and the control exercised by the facts of observation. Thus they write, not so much like scientists indicating the reality of the physical world and of the validity of our knowledge of it, as like descendants of Hume and Kant. They succeed in showing the naïveté of old-fashioned materialism and the uncritical use of scientific concepts by speculative naturalists, but they cannot be said to prove the sufficiency of their own positivism. In short, they are philosophers whose training has been in science rather than in philosophy. Consequently, they possess the defects as well as the merits of their training and outlook.*

Is it too much to assert that the speculations of scientists turned philosophers have demonstrated the necessity of theory of knowledge as a condition of an adequate naturalism? The need naturalism has for a well-founded epistemology has thus been made clear both by its exponents and by its critics. It is, as James Ward points out, a tentative philosophy, and yet a philosophy which has not taken advantage of the critical analyses offered by experts in the field. But why has it neglected these offerings? For two reasons in the main. The scientist has become a specialist seldom acquainted with the situation in philosophy, and, what is more, inclined to be contemptuous of it. Hence, when he starts to speculate, he does it boldly from his own stock-in-trade. In the second place, nineteenth-century philosophy was largely romantic in its bias and itself inclined to be condescending to science. Instead of cooperating, science and philosophy went their separate ways. But this cooperation is an essential condition of the discovery of a true naturalism.

The Situation in Philosophy.—Above the technical dif-

* For a more detailed criticism of these thinkers see my *Critical Realism*. Ch. 2.

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ferences between the various schools of philosophy and to a certain degree determinative of them, worked the opposition between naturalism and romanticism. Idealism has always been anti-naturalistic and favorable to what—for lack of a better term—may be called a religious view of the world. Naturalism, as we have already noted, represented the drift toward a lawful and, so far as possible, physical explanation of events.

While naturalism swung between materialism and positivism, idealism was able for a long time to present a unified front to its opponent. Especially was this the case in the English-speaking countries. Objective idealism was the dominant academic philosophy in England and the United States during the latter half of the nineteenth century. And idealism worked hand in glove with romanticism. It is not strange that the half-articulate naturalism of the time found it hard to cope with such an enthusiastic combination. Yet, on its side, it felt the comfort and support of the vigorous sciences springing up around it. The prestige of science confronted the prestige of religion. The tactical skirmishes between naturalism and idealism were practically always in favor of the latter, but the pressure of numbers on the other side made these victories Pyrrhic.

But the end of this period found new movements in philosophy. The ascendancy of objective idealism was rudely challenged by pragmatism and later by realism. Pragmatism sharply criticized the constant appeal made by transcendental idealism to absolute and virtually non-human standards. It opposed the too-facile monism and dialectical temper of approach of its opponent. Thus the banner of empiricism was again raised and in a more critical form. The fruit of this new spirit is an alliance with the social and biological sciences and a flirtation with naturalism. Perhaps its weakness has been an unwillingness to develop a systematic metaphysics. And yet, in its latest manifesta-

tions, there can be no doubt of the sympathy of an instrumentalist pragmatism with a more broadly conceived naturalism.³

Realism is in deadly opposition to the cherished assumptions of idealism. While idealism has always maintained that the physical world as common sense and science conceive it is illusory if taken as more than phenomenal, realism accepts its independence of the knower and the non-mental character of nature. It will, I hope, be noted that I say non-mental and not anti-mental. As we should expect, realism finds itself in sympathy with the temper and ideals of science. Accordingly, the rise of realism makes possible that cooperative supplementation and interpretation of science by philosophy in which alone lies the hope of an adequate naturalism. Since the whole argument of the present work will concern itself with the pregnant union of science and realism, we need not stress the point further at present. In short, the situation in philosophy has ceased to be unfavorable to naturalism.

The Idealistic Criticism of Naturalism.—The current criticism of naturalism deserves attention; for those who desire to establish an adequate naturalism must heed the objections in the controversial literature. The whole truth was by no means on the side of the older naturalism, even though it did not reside in the camp of idealism (spiritualism) either. What is desirable is not eclecticism but a thorough overhauling of assumptions.

In the main, the chief objections to naturalism of the traditional sort fall under four headings: (1) the denial that the higher can be reduced to the lower without a remainder of supreme importance; (2) the claim that description is not explanation; (3) the existence of gaps in nature

³ This drift of pragmatism toward naturalism comes out quite noticeably in *Creative Intelligence*, a series of essays by American pragmatists. In his review of the last edition of Ward's book, McGilvary points out this fact.

disastrous to naturalism; and (4) the refutation of realism or, as it was usually called, dualism. Let us glance at these objections. We shall see that they need careful interpretation to separate what is true in them from what is false.

We shall admit that there was much truth in the contention that the older naturalism sought to oversimplify by reduction, and we shall try to indicate the historical reasons for this mistake. Probably they reduce to two: the nonage of the biological sciences and the continued dominance of the kinetic conception of all physical processes. The idea of evolution was either unknown or its full implications unappreciated. The first tentative efforts at the application of the idea of evolution were wooden in the extreme. The fact of the matter was that the various connective sciences between physics and politics had not yet sufficiently developed to reach hands across to one another. Naturalism desired continuity between the various apparent levels of nature, but at first could conceive it only as meaning that the higher is nothing but the lower. But supernaturalism—and idealism was often ready to give it comfort—was friendly to the idea of discontinuity. The one wished to achieve continuity by a rough and dogmatic reduction; the other to establish discontinuity. The conditions of an adequate naturalism had not yet been reached.

The claim that description is not explanation itself needs explanation. To explain an occurrence is to give its *why*, the cause or conditions out of which it sprang. Such explanation is, in logic, contrasted with mere empiricism. To explain is to solve problems by the discovery of laws and relations, which are, to my way of thinking, cases of well-formulated knowledge about nature. Wrongly, I think, explanation is frequently thought of as a reference of events to an unseen essence or productive activity. When *explanation* is so conceived, the work of science is said to be detailed *description* of things and events as research pre-

sents them to our minds. It is what I would call knowledge about the physical world. Explanation of events must rest for us in such descriptive knowledge about their conditions and setting; and the logic of investigation must convince us that there is an essential fidelity to reality in such descriptive explanation. Professor Ward's thesis that such symbolic description as characterizes modern science is arbitrary in anything else than the symbols used is agnostic and unjustified.

What these critics of scientific explanation have in mind is, so far as I can make out, something as follows. We cannot intuit nature so as to appreciate the inner necessity which moves things to act as they do. Perhaps it would be better to speak of the inner expression of things of which their behavior is a function. Laws give knowledge about things in relation but no living glimpse into their counsels. To say that A attracts B is to say that B approaches A. But can we *sense* this attraction, this dynamic continuity which has this result? Assuredly not. Hence science does not really explain.

But can any other discipline penetrate to the veritable springs of change? Only the idealist makes this assumption, and he claims to achieve this ideal by analogy. Cause is desire and will. That may be, yet the scientist may well reply that what explains every event explains none. Scientific explanation with its specificity and genuine knowledge about things is as necessary and as valid as ever. The critics of science believe that they can supplement science and, I suppose, hope to clear the way for some mysterious teleology more harmonious with idealistic hopes than the matter-of-fact results of science. I must admit that I can see no escape along this path. There is a discoverable orderliness, massiveness and immanent executiveness about nature.

The frequent emphasis by idealists upon supposed gaps

in nature cannot be regarded as an attack upon naturalism alone. On this point, naturalism and science are in the firmest alliance. Religious idealism displays a disposition to belittle science itself, and to build upon the fact that its tremendous tasks have not yet been completed. But those who comfort themselves in this way are like squatters who fear that the rightful owner may at any time appear and claim his property. The history of the struggle between vitalism and the physicochemical view of life illustrates this situation very well. As long as vitalism stood for a protest against too easy solutions, it was justified by the prodding it gave to facile dogmatism. But when it represented an appeal to some factor out of physical nature, it hampered research. Advances were achieved in spite of it instead of by it. Let us admit that the conception of evolution is an hypothesis. What better systematizing theory is there to put in its place?

But the strategic attack upon naturalism made by spiritualism has always involved the supposed proof that physical realism is epistemologically faulty. We shall have much to say of this in the next two chapters, but we have already paid our respects to the contention, elsewhere. Spiritualism has been avid to prove that science deals only with phenomena. Granted this by bewildered science, it has gone on to argue that orderliness and intelligibility of phenomenal arrangements implies an orderer. We might well ask it to supply the major premise of this argument. May not our own intelligence be an expression of this innate orderliness of nature? But the assumption which modern realism will not admit is that nature is phenomenal. We know nature through the data it controls in our minds. The data, not nature, can be called appearances.

The Inadequacy of Past Naturalism.—Aside from its philosophical immaturity, past naturalism had three main

weaknesses. These we have in a measure already rehearsed, but a degree of repetition from another angle may be of advantage. Naturalism sought too blindly to reduce or disintegrate, as though novelty could not arise, as though the organic could be only the inorganic. It was dominated almost entirely by the exact sciences with their stress upon quantities. And it did not enough recognize the reality of mind and of those human organizations and events for which mind is pivotal. In brief, past naturalism did not take evolution seriously nor did it take mind seriously. As we shall try to show in the course of our general argument, these two shortcomings are very closely connected. An adequate naturalism must reckon without condescension with biology, psychology and sociology.

To explain by means of analysis is an ideal native to science. Only by tracing strands of dependency in the physical sciences, only by abstraction and selection in the logical sciences was knowledge able to advance. Experience comes to us too complex and interwoven for comprehension. Hence the early history of science is an account of the successful reduction of the complex to its elements. Movements are shown to be the resultant of components and optical processes of many vibratory factors; heredity to be carried by correlated unit-characters; personality in some measure an organization of acquired habits; and chemical compounds of recoverable elements.

But in its zeal for analysis, science often forgot the fact of synthesis. Because it could disintegrate and identify, it tended to ignore the organization which had been dissolved. In other words, the temptation was to level down, to say that chemical compounds are *nothing but* the atoms into which they can be disintegrated, to refuse to see the significance of the dynamic whole upon which operations had been performed. The result was a *naturalism of reduction*. The following quotation from James is a relevant

criticism of this reductive naturalism: "The mention of material substance naturally suggests the doctrine of 'materialism,' but philosophical materialism is not necessarily knit up with belief in 'matter' as a metaphysical principle. One may deny matter in that sense, as strongly as Berkeley did, one may be a phenomenalist like Huxley, and yet one may still be a materialist in the wider sense, of explaining higher phenomena by lower ones, and leaving the destinies of the world at the mercy of its blinder parts and forces."⁴ The old naturalism ignored novelty and evolutionary synthesis. An adequate naturalism must not make this mistake.

Was there not a tendency in the past to confuse conceptual analysis with physical analysis? The anti-intellectualist of to-day complains that analysis changes the facts or ignores relations. To assert that an organism has parts seems to him to deny that these parts are interdependent. To this complaint the realist can only reply that he does not see the necessity. But physical analysis, actual dissection, does destroy the whole. And there can be little doubt that kinetic theories favored the identification of physical and conceptual analysis.

This brings us to a consideration of the second source of weakness of past naturalism. It moved within the circle of ideas and facts native to the exact sciences. The consequence was an incompleteness of which thinkers interested in biological and mental facts rightly complained. The world tended to lose space-and-time-filling content and to assume a purely mathematical character. The evolutionary differences in nature were ignored as irrelevant. We shall have more to say of this situation when we come to treat of the mind-body problem. Recent discoveries in physics have, however, put a stop to this abstractive tendency. The physical atom has come to its own once more.

⁴ James, *Pragmatism*, p. 92.

And, what is even more significant, the category of organization and the idea of evolution are moving downward.

That the naturalism of the nineteenth century did not do justice to "mind" is pretty generally acknowledged. But we must remember that psychology was hardly a science as yet and that biology was largely natural history.

It is not surprising that little agreement could be found between such extremes as physics and introspective psychology. The idea of intermediate levels genetically connected had not arisen. And yet the fearless naturalist of the day sought to maintain that the laws of mental operations are similar to those found in mass movements. Thus this stage of naturalism appears in psychology as associationism of a sensationalistic type. Mental atomism corresponded to physical atomism. The aim of this associationism is apparent. If mental events are governed by laws similar to those found in physics, the disparity between the physical and the mental was surmountable. The older forms of psychophysical parallelism reflected this manner of approach to the mind-body problem.

But instead of bringing mind down to the brain as kinetically conceived, why may we not bring the brain up to the mind as empirically analyzed? Such is the endeavor of evolutionary naturalism. We shall hold that even psychophysiological parallelism does not do justice to the empirical facts.

Evolutionary Naturalism.—If naturalism is the view of the world which finds itself upon the results of science, it follows—does it not?—that the texture and breadth of naturalism will alter as the sciences alter and as science is enlarged by the frank admission of new sciences in the commonwealth of tested knowledge. So long as mechanics was the master science to which the other sciences were ideally reducible, naturalism was simplicity itself. It

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was a dogmatic metaphysics for which all occurrences could be adequately described in terms of equations. But its very simplicity was, as we have seen, against it as soon as reflection upon all features of the world attained maturity.

It was the growth of science, itself, that undermined the older naturalism. Philosophy could only have held naive naturalism at bay had this not been the case. It is, therefore, evolutionary naturalism that I shall seek to develop and defend. Chemistry, biology and psychology have become autonomous, concrete and profoundly expressive of evolutionary ideas. It is no longer possible for a *fair* critic to identify naturalism with the mechanical view of the world. Scientists are tentatively reaching out for more flexible and less dead-level ways of approach. Evolutionary naturalism is not a reductive naturalism.

While naturalism could plausibly be linked with mechanism and be called "physics treated as metaphysics," philosophy could make a dialectic use of sharp contrasts, such as blind necessity and human freedom, fixed law and purpose, chance and design, matter and spirit, etc. No one can deny the rhetorical effectiveness of these contrasts; nor, I think, can it be doubted that effective use of them has been made by idealistic writers. But it is time to lift the controversy above this dialectical level which, after all, got no one any great distance, and to live critically into the knowledge we actually possess to-day. *And yet I would not be understood as refusing to recognize the truth of much of that for which idealism stood in opposition to the older naturalism.* But has not the time come for a thorough overhauling of the epistemology and *Kategorienlehre* of the past? It is something of this sort—however imperfectly—that I hope to accomplish.

If, as even its opponents admit, naturalism is a view of the world which flows by inner necessity from the ac-

complishments of science, the philosopher can pride himself that his function is like that of an artist who adds finishing touches here and there to some massive, cooperative work. The evolutionary naturalism which the keen eye can discern is like the statue hidden in the marble. Much must be done before it can be released. Just because the common result of all the sciences is the concern of no one science, there is need of a discipline of a comprehensive nature.

As we have constantly suggested, the cooperative assistance open to philosophy takes two lines: epistemology and the analysis of the categories. Seldom is science aware of the need of a theory of knowledge, yet the scientist who attempts to speculate stumbles around rather blindly for lack of it. On the other hand, science begins to make use of new concepts or categories long before it has clearly formulated them. We should expect this "lag" if we bear in mind the fact that categories have their birth in experience and that experience comes bit by bit in new fields. A critical eye, not concerned primarily with specific problems, can note changes of ideas and methods of interpretation that the busy specialist will overlook. To analyze and comprehend these large "forms" of cognitive experience is the self-appointed task of the philosopher.

If naturalism is usually an implicit system of philosophy, let the philosopher who is in sympathy with science make it explicit. Let him honestly face all difficulties and at least show how they can probably be met. His can be no narrow naturalism limited to the physical sciences. The *whole* of man must be included in nature, and nature so conceived that this inclusion is possible.

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EINSTEINIAN SPACE AND THE PROBABLE NATURE OF BEING.

AN ADVENTURE IN METAPHYSICS.

THE achievement of Professor Einstein of Leipzig University, after long and thorough discussion, is recognized by science as the greatest feat in pure mathematics as yet accomplished by the human mind; though, as is to be expected, the ultimate validity of all of his conclusions does not enjoy quite the same status.

That he was anticipated in some respects by Oriental philosophers a thousand years before Christ does not detract from his own work, which was carried out independently, from different bases and by different methods.

We will not deal here with the mathematical mechanism of his work, which is of the nature of calculus of a very advanced form, and which it is said is understandable to only a dozen men in the world; but will deal with certain consequences and some possible interpretations thereof.

The most important consequence is the concept of time as a fourth dimension of space. We are familiar with the common mathematical representation of the three dimensions of space; length, breadth, and thickness. These dimensions are represented by three lines, each at right angles with the two others. The possibility of a fourth dimension, representable by a line at right angles with all three of our present axes (a condition inconceivable to the human mind), has long been discussed.

Einstein seems to show that this fourth dimension actually exists, being none other than our familiar, but incomprehensible entity, time itself. In other words, the illusion of time proceeds from a translation of the observing entity through the true four-dimensional space, the events passed through remaining unchanged and permanent in position in true space. By a rigid mathematical demonstration, he shows that the axes by which any given observer locates and orients himself in time and three dimensional space (that is, in true space), may be made to coincide with any other set of axes by a simple process of rotation; concretely, time may proceed in one direction in one part of the universe, and in some other direction in another part, simultaneously. The inevitable deduction is the eternal coexistence of all things in a universe whose component parts are changeable only in their time-space relationships.

In our three-dimensional space, the path of a particle forms a line representable by its projections on the planes determined by the three axes of reference. In Einsteinian space the same rule holds good, but the concept must be extended to include a projection on the additional plane postulated by the existence of the time-dimension. This projection is what appears to us as the passage of an entity through events. The true and unique path of the entity through time-space is termed by Einstein the "world-line."

Since two entities can contact one another only when they meet in both time and space, a meeting of entities implies an exact intersection of their respective world-lines. If a human mind becomes conscious of any other entity, of any nature whatsoever, it can only be because the world-line of that mind intersects that of the other entity in time-space at that particular point.

Let us leave this development for the moment.

Einstein assumes (and seems to prove) that energy is affected by gravitation. In fact, if matter is a form of

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energy, this must be the case; and modern research tends more and more to that hypothesis.

If this be so, then all things are subject to the influence of gravitation, since, giving the term its widest possible meaning, nothing exists save energy and its modification, matter.

Calculating upon this basis, Einstein correctly predicted certain astronomical phenomena; and other possible confirmations are still under test.

A hypothesis in good standing at the present time is that of the curvilinear nature of space. I cannot say just what its origin is, or what relation it bears to the more general aspects of Einstein's theory, so must leave the discussion of its validity to deeper students, while presenting for what it may be worth, a hypothesis erected thereupon.

From here we will attack the problem of being with three assumptions: time as a dimension of true space, all existing things as modifications of energy, and the curvilinear nature of space.

It is not illegitimate to consider consciousness and its activities as forms of energy; in fact, it is not conceivable that they can be anything else. From this we may imagine that the matrix of consciousness, which we will term Being for convenience, is a form of that which manifests as material phenomena, or matter and energy. Let us go another step and consider that Being is the original and primal substance of the universe, capable of that movement or modification which we term consciousness; and that consciousness manifests only upon some manner of contact; including in the word contact all forms of sensation, mentation, etc.

Thus the only distinction between a conscious and an unconscious entity would be in the nature of their respective contacts; and not at all in their essential substances.

Thus the substance of Being in the atoms of a stone appears as unconscious to the perceiving mind simply because the world-line of the mind intersects the world-lines of the atoms of the stone at such angles that contact with the mind does not arouse consciousness within the Being stuff of the stone.

It will be noted that on this hypothesis we must define the atoms of the organs of perception as belonging, during the process of perception, not to the mind-combination, but to the stone-combination; and we must imagine the mind as looking on at the process of perception, but not taking part therein.

As a matter of experiment, let us drop all preconceived ideas, and start afresh with the only statement of whose truth we can be sure, in the ultimate meaning of the word: "I think, therefore I am." Let us follow this with the next most reasonable hypothesis: we think only when stimulated by contact; a single mind in the universe however potentially conscious it might be, would never develop actual consciousness; therefore something more than the I which thinks must also exist. Let us add another reasonable hypothesis: that the ultimate laws of nature are probably of the utmost simplicity.

Now we have: A certain sure fact and two reasonable assumptions:

First: I am.

Second: Something else is.

Third: The ultimate law of That Which Is is simplicity.

And three apparent facts:

First: Four-dimensional space, time as one of the dimensions.

Second: Space is curved.

Third: All is of one nature, possibly energy,
say Being.

It will be noted that number three of the second series would follow from three of the first series; and we will show that the second of the second series would also follow from it. It might also be said that the first of the second series comes in this category as well, for time as an integral dimension of space is surely a simpler idea than time as a separate, unrelated, and altogether unknown thing.

Reasoning from the postulate of simplicity, let us take our bases in order.

The utmost simplicity of Being would lie in the existence of a single entity in the universe; but we have seen that more than one entity exists, and we may as well admit at once that an infinite number may exist, for infinite multiplicity, from the philosophical standpoint, is just as simple as duality. So let us fall back upon the next most simple assumption: that the component entities of the universe are exactly alike in all their qualities, and that all are like particles of the stuff of Being itself. Term these entities monads. As to their nature, it must for the present remain purely metaphysical; they certainly must be some more primitive manifestation even than electrons; perhaps an electron may be made up of thousands of monads. Note that each monad is potentially conscious, containing all the possibilities of sensation and mentation, possibilities which become actualities only upon contact with other monads.

The path of each monad through time-space, must, from simplicity, have the same form of equation as that of any other monad. The simplest equation is that of a straight line. For the time being, then, let us imagine the world line of each monad as a straight line; we shall see later that

a straight line is the simplest form only from the standpoint of three dimensional space.

To get at the nature of space from the assumption of simplicity, we may reason thus: three-dimensional space is either limited or unlimited: if limited the simplest form is seen at once to be a sphere.

If three-dimensional space is unlimited, then the form of four dimensional space is the metasphere whose shadow in three-dimensional space is the sphere; for unlimited space is that in which a line of unlimited length may be produced in any direction, and if three-dimensional space is considered as the surface of metaspherical four-dimensional space, this holds good, since the simplest form of a line in the surface of a sphere is a circle, which is endless.

To our three-dimensional senses, such a circle would appear as a straight line as far as seen, since our only criterion of straightness would be such a circle itself.

Of course, if three-dimensional space is curved, the simplest form of curvature would be the surface of the metasphere. As an additional support to the curvilinear theory, it will be noted that the human mind can make some approach to the idea of the fourth dimension by its aid, and none at all without it.

It will be noted incidentally that if three-dimensional space is in the form of a metaspherical envelope, our conception of space has nothing at all to do with the true extension of space; space may be of infinite extent or of infinitesimal extent, using the words in their usual meaning. It may be even non-existent to all human conceptions.

Using the idea of an infinite number of similar monads following an infinite number of similar paths, let us bring the conception down to our level by subtracting a dimension from each of our factors, so to speak, thus imagining ourselves as animals conscious only in a surface.

Then we have for true space, a sphere; for our per-

ceptible space, the surface of that sphere; for the monadic world-lines, circles inscribed in that surface, and for the monads, beings capable of contracting one another only when their circles intersect.

The monads move; otherwise there would be no manifestation; the "I" could not think. The simplest form of motion is uniform motion in a straight line; but the straight line of three-dimensional space is the circle on the surface of the metasphere. So we have the monads in uniform motion along the circles inscribed on the surface of our sphere. By simplicity, each circle would be a great circle of the sphere. An infinite number of great circles may be drawn for any sphere, intersecting in an infinite number of points at an infinite number of angles.

Therefore any one monad, starting from a point and returning thereto, might experience any given number of contacts in the course of its cycle. Any experience which a monad undergoes would be the integration of the contacts experienced at that point in time-space, and its nature would be determined by the number of other monads taking part in the meeting, and the angles of intersection of their world-lines. All events, of course, would be absolutely cyclic, recurring as often as the monads completed their circles. We are struck here by the fact that the greater number of events perceptible in nature really are cyclic; and it is reasonable to suppose that such as do not appear so to us, do not so appear, simply because we cannot see enough of the arc to perceive its circular nature.

Thus we have a hypothesis by which the simplest form of Being, following the simple form of path, in the simplest form of space, gives rise to all the visible phenomena of our universe.

There are innumerable consequences to this hypothesis, upon some of which we will touch.

First, immortality would be an absolute fact, whatever the nature of the soul might be, for all things would be periodically reconstituted. However, in order to satisfy the emotional desires of the normal mind, it would be necessary to prove that the periodical existence of the soul is of greater scope than that seen in our present lives. This, however, might well be the case, as the above seems to demonstrate our absolute present ignorance of true reality.

Second, all experiences and existences perceptible to us, must in the philosophical sense of the word, be pure illusion, owing their apparent orderly sequence to some geometrical pattern in the arrangement of the monadic world-lines; a pattern which it is reasonable to suppose would be of utmost simplicity in some way.

A simple syllogism furnishes an added piece of evidence as to the cyclic nature of Being.

Something cannot arise from nothing; something now exists, therefore something always has existed. That which exists undergoes constant change; if the changes led to any fixed culmination, that culmination would have been reached in the course of past eternity, and no changes would now be taking place. By all our known laws, all the energy in the universe would have flown to a dead level, and all things would now be motionless and consolidated in a single dead mass.

If all movement is not cyclic, some power must have interposed to reverse the current of events, to change for a time the laws of nature. This conception is repugnant, and not to be compared with that of a cyclic universe with immovable and unchangeable contents and laws.

Now, the reader has probably observed that we are standing on the edge of a gulf into which it is not well for the human mind to look too long; for the periodical nature of manifestation implies a thing which bears the same

relation to four-dimensional space which time bears to three-dimensional space, and so on *ad infinitum*.

With this observation we return to the world of sanity and normal mentation, leaving to bolder and better equipped minds the further development of the idea.

CAPT. VICTOR A. ENDERSBY.

CRITICISMS AND DISCUSSIONS.

THE MEANING OF CHANCE.

Examinations of the concepts of *chance* spread as if by a kind of logical contagion through the three broadly distinguishable fields of philosophy—metaphysics, logic and the theory of knowledge. A confusion of these three aspects of the subject has caused much of the difficulty in determining what a judgment of chance measures, and in showing the place of the laws of chance among the other laws of logic. With the hope of avoiding some of these confusions and of giving a sharper definition to the concept, the present essay will treat chance under these separable heads: the logic of chance, the epistemology of chance, and the metaphysics of chance.

The Metaphysics of Chance.

Chance as a concept often accompanies indeterminism. There can be no real chance in a deterministic world, we are told, nor any determination in a world of real chance. Upon this issue two radically opposed types of metaphysics arise. They are at one only in agreeing that chance is to be linked to some ultimate principle of reality.

Says the determinist: "There is no doubt in the lightning as to the point it shall strike: . . . not a grain of sand lies upon the beach but infinite knowledge would account for its being there; and the course of every falling leaf is guided by the principles of mechanics which control the motions of the heavenly bodies. Chance can not exist in nature."¹

If there were a world of real chance, the determinist would

¹ Jevons, W. S., *Principles of Science*, Ch. X, pp. 197-8.

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look upon it as a chaos. But according as one has or has not a liking for revolution and novelty, one becomes a *tychist* or a strict determinist. Peirce, who invented the term *tychism*, says: "Now the only possible way of accounting for the laws of nature and uniformity in general is to suppose them results of evolution. This supposes them not to be absolute, not to be obeyed precisely. It makes an element of indeterminacy, spontaneity, or absolute chance in nature."² Peirce refers to this as "that way of thinking which it will be convenient to christen tychism."³ Thus, on the one hand, is a Bergson or a James insisting upon change, newness, deviation from law as the ultimate truth about reality; on the other, a Jevons or a Mill holding fast to necessity, and causes and effects.

A definition of chance which sets out from either of these metaphysical premises must solve the dilemma of chance and necessity by making one or the other a superficial character of experience. Chance must be appearance and necessity reality, or vice versa.

If the universe is tychistic, the causal connections in it will be like habits in the life of a man who has no general plan of living. They are temporary uniformities, crystallizations out of the flux. They will give way to new and different uniformities. No law is eternal except chance; the laws of nature by which events seem to be determined are an insecure crust upon the deeper flow of change.

The usual view is the reverse. Most writers hold that chance is the illusion and necessity, the reality. This view makes a stronger appeal to common sense. Human habits of thought make it easier to believe that "every falling leaf is guided by the principles of mechanics" than to suppose that the principles of mechanics are, themselves, a phase in the lawless transformations of the universe. On this view, every event belongs somewhere in a setting of strict law. If nature appears at times to follow no rule, that is not because there is no rule.

The conventional way of dealing with illusions is to assign them to the mind. This is the classical method of defining chance, with Laplace as authority. Chance is an appearance due to human ignorance. To the all-knowing mind there is only necessity. If we are ignorant of the causes of an event, says this view, we can not predict it with certainty; we can only hold a belief about its occurrence. It seems to follow that the measure of the strength of this belief will be the measure of the chances of the event.

² Peirce, C. S., *The Monist*, Vol. I, p. 164.

³ *Ibid.*, Vol. II, p. 533.

Having first been an appearance, and then a mental illusion due to ignorance, chance now becomes the degree of intensity of a belief. De Morgan states this position in its most radical form. "By degree of probability we really mean, or ought to mean, degree of belief," he says. "I throw away objective probability altogether and consider the word as meaning the state of the mind with respect to an assertion, a coming event or any other matter upon which absolute knowledge does not exist."⁴

We see what are the results of bringing in the metaphysical question of determinism: chance and necessity are distinguished as appearance and reality, and chance is assigned to the mind. If the metaphysical question be not raised, we can discover a neutral view. Neither chance nor necessity need be fundamental, and at the same time both can be intelligibly accounted for. There will be no metaphysics of chance. The nature of reality, whether changing and lawless or strictly determined, will not be in question.

The sanction of this non-metaphysical view is pragmatic. Experience can be treated both as if it were a series of chance events and as if it were bound together by strict laws. But to treat it in either fashion is not to prove that it is *really* one or the other.

Nature presents all degrees of uniformity from the startling appearance of a new comet to the regular motion of the planets about the sun. To certain uniformities we give the name of natural laws. They are those uniformities which have been tested by many observations and fitted into place with other uniformities, and from which no deviation is known to occur. The laws that light travels in straight lines is such a uniformity. But there are other uniformities (the word being widely interpreted) which hold *on the whole*, though not strictly. Such is the uniformity, extensively verified by experience, that about fifty-one per cent. of all births will be female births. This is a statistical uniformity. It admits of variation and exception. It compromises with the disorderly character of the facts by making its demand for uniformity less rigorous.

Statistical propositions afford a means of handling different degrees of orderliness. So long as experience is sufficiently coherent to present *things* or *events*, the statistical method can make some generalizations about the relations between these things or events. The connections in experience thus generalized will be chance connections. No absolute prediction of any event or thing can be made upon them.

⁴ De Morgan, *Formal Logic*, p. 172.

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To say that anything comes about by chance means, then, that it follows from certain conditions with a regularity which is not absolute. The measure of its regularity (or irregularity) will be the chance of its occurrence. No answer is implied as to whether *reality* is regular or irregular, uniform or disorderly, determined or undetermined.

The world seen under the aspect of chance is the world from a different point of view. It is not a different world. If we frame generalizations which hold on the whole, or in a proportion of all the cases which they cover, we are dealing with experience as a thing of chance. If we frame generalizations which hold without exception, we are dealing with it as a thing of necessity.

We may ask for what reason does one wish to view experience as a series of chance events. Why use statistical generalizations?

In the first instance, some statements of fact can be generalized only in the statistical fashion. It is impossible, for example, to state the general conditions of weather changes so strictly that there will be no exceptions. Statistical generalizations are forced upon the meteorologist by the very nature of his facts.

For the Laplacian theorists of chance this would be a case of human ignorance. To the all-knowing mind, they would say, the weather must be an open book. But the all-knowing mind is only another form of the premise of determinism. Completer knowledge would reveal strict connections only if strict connections existed. If there were no rigid uniformities into which the facts would fit, as the indeterministic metaphysics asserts, then no amount of knowledge would produce a rigid generalization. A statistical statement would be the only possible means of generalizing from the facts.

All generalization is a process of extending human knowledge. It is effective in proportion to the range of facts included and to the elimination of human ignorance. Statistical generalizations are no exception; they are an attempt to surmount ignorance. But only upon the deterministic assumption can human ignorance be said to be the *raison d'être* of the statistical method.

Secondly, statistical generalizations may be used for convenience. Strict laws by which the phenomena in question are determined may or may not be known. Such for instance would be the statistical distribution of molecules assumed in the kinetic theory of gases. Each molecule obeys the laws of motion; but it is not convenient to calculate what each molecule would do. Statistics are

thus suitable for synoptic views. The all-knowing mind, even in a determined universe, might prefer to class together many events and deal with them as masses, rather than to follow out the tedious details of each. It is obvious that in such cases the extent of our ignorance or knowledge would not affect the chances involved.

Chance, therefore, need not be defined in metaphysical terms. The use of statistics does not imply that reality is either determined or undetermined; and the utility of the statistical method does not rest upon ignorance.

The Epistemology of Chance.

We have shown that it is a short step from the deterministic view of chance to the corollary that a degree of chance is the degree of certainty or uncertainty of a belief.

What is the relation between belief and judgments of chance? This is the epistemological question.

To affirm, for example, that the chances of death at sixty are greater than the chances of death of twenty-five appears to be a plain statement of fact. Like any statement of fact, it may be believed or disbelieved. The intensity of the belief will not constitute its likelihood. If the likelihood of a proposition believed were created by the intensity of the belief, necessity would be created by irresistible conviction. A judgment such as the one just given refers to the facts of experience, as does any other judgment. It states in the last analysis that more people die at sixty than at twenty-five. This is its factual content. If this is true, it will be a correct judgment of chances. We need no special category of knowledge in which to place it.

This is proper enough, it will be answered, so long as we confine ourselves to the statistical generalization—that the proportion of deaths among men of sixty is greater than the proportion of deaths among men at twenty-five. But suppose we inquire about the probabilities of Tom Jones's death at these two ages. We must then affirm that a particular proposition, "Tom Jones will die at twenty-five," has a probability. Is this a statement of fact? Certainly we do not affirm the fact to which the particular proposition refers: we do not say that Jones will die at twenty-five. Neither do we deny it. But we do affirm something, which is a fact, about the whole proposition. We say it has a certain probability. Now, the probability that Jones will die at twenty-five is the same as the

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probability that *any* man will die at twenty-five. Jones is a specific value for the indefinite article "any." What we are affirming about the probability of this particular proposition can also be affirmed about a class of propositions, viz., about all the propositions which assert that someone will die at twenty-five. It is because the particular proposition is one of a class of such propositions that the particular proposition can be judged probable. The judgment of probability is a statement of the fact that a certain number of the propositions in this class are true and a certain number false. The statistical generalization that "*ten per cent.* of all men die at the age of twenty-five" is another way of stating that "*ten per cent.* of all propositions which assert that some man will die at twenty-five are true."

The relation between a judgment of the chances of a particular event and the statistical generalization upon which it is based is a matter of logic, and will be treated as such under the logic of chance. It rests upon the axiom that what is true of all members of a class is true of a particular member. Statistical generalizations deal with classes of propositions; and hence, the frequency of truth found in the class will be the probability of any particular proposition of the class. One may either correctly or erroneously believe that this truth frequency has a certain value. But the belief will not affect the value.

This is simple enough and yet the point has been a source of endless confusion. A particular proposition, we are told, must be either true or false, with no middle ground. Probability seems to be such a middle ground and, therefore, it must be an illusion. But it is evident that a particular proposition may be true or false and also probable. "Tom Jones dies at twenty-five" will be true or false as the facts decree. It may be also probable, because the judgment of its probability does not either affirm or deny that the proposition is true or false. There is no contradiction here. The judgment of its probability lies in another plane.

Bound up with the view that chances are created by human beliefs is the prejudice that chance refers essentially to the future. But whether the event whose likelihood is in question has or has not come to pass, it remains a chance event. Either before or after Tom Jones's death, the probability that he will die before he is twenty-five has a meaning and a numerical value. This is a corollary of what we have said before. There is no absurdity in speaking,

after Jones's death, of the probability that he might not have died, which is an admission that his death is still in the realm of the probable, though it has actually come to pass. Very often past events are spoken of as improbable, surprising, or unlikely. If probability did not exist after the event as well as before, such a habit of speech would be pure nonsense.

It must be concluded that chance is as objective as any matter of fact. It belongs in no way peculiarly to the belief side of knowledge. It is a matter of experience to be handled by observation and ordinary methods of verification.

The Laplacian theory of chance is often called objective, but it is far from being objective in the sense just defined. Laplace says: "The probability of an event is the ratio of the number of cases which favor it to the number of all possible cases, when nothing leads us to believe that one of these cases ought to occur rather than the others, *which renders them for us equally probable*."⁵ It is the last (italicized) clause of this definition which makes probability objective. This is the equal distribution of ignorance. The fundamental axiom of the theory is: where nothing is known about the likelihood of an event, its probability is one to two. It is as likely to happen as not.

This axiom may be taken as self evident or it may be grounded in experience, as it is by Edgeworth. "I submit, the assumption that any probability constant about which we know nothing in particular is as likely to have one value as another, is grounded on the rough but solid experience that such constants do as a matter of fact as often have one value as another."⁶

In any case, ignorance is a very poor ground upon which to base knowledge. We have mentioned reasons for disregarding ignorance as a factor in chance. It is peculiarly difficult to understand why we should be permitted to prescribe that an event of whose conditions we know nothing must occur in fifty per cent. of all cases. Any other guess would be equally permissible. Each *a priori* guess of the probability of an event must wait for the facts to corroborate or refute it. The statistical method must accept the irregularities of experience as it finds them. There can be no equal distribution of ignorance.

Judgments of chance, therefore, show no epistemological pecu-

⁵ Laplace, *Theorie Analytique des Probabilités*, liv. II, Ch. I, no. 1.

⁶ Edgeworth, *The Philosophy of Chance*, Mind, N. S., Vol. IX (1884), p. 230.

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⁷ Royce
Vol. I. p. 8

liarity. Judgments of chance differ only in one respect from particular judgments of fact. They are judgments *about* propositions. Their subject matter is the relation of a certain proposition to certain other propositions. This is still within the realm of fact.

We may now ask specifically what is the meaning of the statement "that a proposition, *p*, has a probability, *P*." This will lead to the logic of chance.

The Logic of Chance.

There are two distinguishable varieties of chance: restricted chance and unrestricted chance. Another name for unrestricted chance is bare or antecedent probability.

On the Laplacian theory, bare probability is associated with complete ignorance. The philosopher who says that *a priori* all things are equally probable (or possible) has in mind unrestricted chance.

We may ask if a bare or unrestricted probability is not a contradiction in terms.

We have said that so long as experience is sufficiently coherent to present *things* or *events*, the statistical method can be applied. This is a condition, very general, to be sure, which experience must fulfill in order that chance may have any meaning. Before we can even speak of the antecedent probability of a thing or event, experience must give us things and events. Peirce says, on this point, that the application of the statistical method demands a universe with some character. "The presupposition of the determinate constitution of any set of facts such as are subject to inductive investigations is by no means a simple, not even a 'self-evident,' presupposition. . . . But the presupposition, as Peirce has shown, is the one natural and indispensable presupposition in all inductive science."⁷

It will be convenient to substitute for the terms *things* and *events*, the more general term, *propositions*. Propositions assert the existence of things or the occurrence of events.

The minimum condition, then, upon which any proposition can be barely probable is that it shall be at least a proposition, capable of truth or falsity. This is the meaning of Peirce's statement that chance demands a universe with a constitution.

⁷ Royce, J., *Encyclopædia of the Philosophical Sciences*, edited by A. Ruge, Vol. I. p. 83.

We are here in contact with something equivalent to the logical universe of discourse. The widest context in which chance has a meaning is the world of any or all events, or the world of any or all propositions. Unrestricted chance is, therefore, chance under no special condition, but under the most general possible condition.

Specific statistical researches do not deal with antecedent probabilities. Statistics are always gathered within a limited field, i. e., a restricted universe of discourse. They are significant only upon the special conditions which hold within that universe. The *consistency* of a set of statistical propositions demands a strict adherence to the limiting conditions.

When the probability of a proposition depends, thus, upon the truth or falsity of some other specific proposition, we have a case of restricted chance. We shall call it "probability upon." It is in this form that probability is most familiar and useful. The probability of bad weather, for instance, is not a bare probability. It is not probability *in vacuo* under the widest possible conditions. It is based upon specific conditions: a certain degree of humidity, a certain velocity of wind, a certain geographical situation. Given other specific conditions, the probability will differ.

The difference between restricted and unrestricted probability may be summed up as follows: If a proposition, *p*, is probable upon a proposition, *q*, the latter is recognized as a special condition which must be considered before the probability of the former properly has a value other than its antecedent probability. On the other hand, the antecedent probability of the proposition, *p*, will depend upon no special condition. It will be the probability of *p* upon the most general conceivable condition, viz., simply that *p* is a proposition, true or false.

It is clear that the proposition which is probable upon another proposition stands in some sort of logical relation to it. This relation can not be the relation of formal implication, since any implied proposition can be strictly inferred from the proposition which implies it. A probable proposition can never be strictly inferred or predicted from its conditions. The relation is, however, like formal implication. It is a kind of *informal* implication. It takes the "if—then" form which is characteristic of implications.—"If certain atmospheric conditions are present, then probably bad weather will result."

The relation may be called *contingency*. The degree to which

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one proposition or set of propositions is contingent upon another proposition or set of propositions is, in the first instance, the subject matter of judgments of probability.

It will be necessary to analyze the relation of contingency.

In logic the term proposition usually applies to a particular statement which is capable of truth or falsehood. We shall mean by a proposition what Mr. Russell calls an elementary proposition—"a proposition such as 'this is red' where 'this' is something given in sensation."⁸ Thus, a proposition is true or false at some particular time and in some particular situation. But a proposition can be generalized so that what the proposition asserts is true or false at many different times and in many situations. If in place of "this is red" we assert " x is red," we obtain a whole series of elementary propositions by giving different values to the x .

Contingency is a relation between generalized propositions in which an undesignated or variable term appears. Consider the judgment, "If I am descended from a long-lived family, I shall probably be long-lived." The "I" is merely a particular value of an x ; and the judgment remains the same when "anybody" or x is substituted for me.

There is a frequency with which the ambiguous proposition " x is descended from a long-lived family," will coincide in truth with " x is long-lived." This is the degree of contingency of the latter upon the former. The single coincidence of two elementary propositions is uninteresting and unimportant for the theory of chance. Such a coincidence would not give a degree of contingency. Degrees of contingency arise where there is a series of coincidences or failures of coincidence.

The generalized, or ambiguous proposition of which we spoke is a propositional function.⁹ So that contingency is a relation between propositional functions.

The propositional function stands for a collection of propositions none of which is asserted. For the purpose of formal logic there are two ways of asserting a propositional function: (1) we may assert " ϕx always"; i. e., all propositions which are values of the function. This will be formal or universal assertion. (2) We may assert " ϕx sometimes"; which is tantamount to saying "there

⁸ Whitehead and Russell, *Principia Mathematica*, Vol. I, pp. 95-96.

⁹ Whitehead and Russell, *op. cit.*, p. 15.

exists a value for which the function is true." This will be a particular assertion.

Statistics deal with assertions which lie between the universal and the particular, and which are, in De Morgan's phrase, "numerically definite." For the purposes of statistics it must be possible to assert, " ϕx in n cases"; or "there exist n values for which the function is a true proposition." By means of this concept—"the n true propositions which are values of the function ϕx ," where this totality is finite, probability and other statistical ideas can be given a strictly propositional interpretation.

The degree to which one propositional function is contingent upon another can be stated in numerically definite terms as follows: There exist n true values of a certain function, ϕx . There exist, also, m true values of the coincidence of this function with another function, ψx . The proportion m/n will measure the degree of contingency of ψx upon ϕx . (The conjunction or coincidence " ϕx and ψx " is itself a propositional function which, like any function, may be true for all values, for some values, or for m values.)¹⁰

This is exactly what we mean when we judge, "the probability is P that if x is descended from a long-lived family he will be long-lived." There are a number of cases in which it is true "that x is descended from long-lived family and x is long-lived." The proportion of these cases to all the cases in which it is true "that x is descended from a long-lived family" will be the degree of contingency of longevity upon descent from long-lived ancestors.

In general, then, the degree of contingency of one propositional function upon another will be determined by two existential propositions: (1) There exist m true values of the conjunction of the functions, and (2) there exist n true values of the conditioning function. We may look upon this "degree of contingency" as a relation, just as disjunction or implication is a relation. But we are dealing in this instance with more than a single relation. We have a class of relations. Wherever a ratio such as that just defined exists, the functions involved stand in a contingency relation. But for different cases we shall have different contingency relations, different degrees of contingency.

The contingency relation will be a formal relation. It will hold for all values of the variable. Thus, in the example given

¹⁰ The case in which either n or m is infinite is not included in the definition. It is essential that they be finite numbers, since a ratio with an infinite term has no numerical interpretation applicable to the concept of probability.

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above, whatever value x assumes, the relation will still be the same between longevity and descent from a long-lived family.

It is because contingency is a formal relation that any two elementary propositions which are values of contingent propositional functions can be said to be contingent. "What holds of *all* holds of any." This is a primitive proposition of logic. So, if "John Smith" be substituted for x in the example just given, it will be true that the particular proposition "John Smith will be long-lived" will be contingent in the degree P upon the particular condition "John Smith is descended from a long-lived family." We have said above that such a judgment does not commit us to stating the truth or falsity of either of these two elementary propositions. They may both be utterly false. John Smith may be a saw-dust doll, who has neither ancestors or life. That will not invalidate the judgment of probability, for the judgment says that "if John Smith were descended from a long-lived family he would be long-lived in all probability."

It is now clear what is the subject matter of judgments of chance. They affirm that a certain formal relation of contingency subsists between propositional functions. They are to be classed with the hypothetical judgments of traditional logic, which assert the subsistence of the relation of formal implication.

How does the formal relation of contingency appear in cases of unrestricted or antecedent probability? There the probability depends only on the most general condition: that the proposition in question is a proposition, capable of truth and falsity. It depends upon the general state of the universe. The antecedent probability of a proposition will be the ratio of all true values of the propositional function, of which the proposition in question is a value, to all values of the function, both true and false. Thus, the antecedent probability of " x will die" will be the proportion of all cases in which this is true to all cases in which it could be either true or false. This will be its degree of contingency upon its mere subsistence as a proposition in the widest possible universe of discourse. Antecedent probability, can, therefore, be defined in terms of restricted probability or "probability upon." It is probability upon the unrestricted universe of discourse.

Much complexity may appear in the chance relations of propositions. So far we have spoken only of the contingency of one proposition upon another. The conditions upon which a proposi-

tion is contingent may be many. Similarly, the contingent proposition may be, not a single proposition, but a complex system of propositions. As a simple illustration, consider life insurance. The conditions upon which life is dependent are not health alone, but also age, occupation, residence, etc., and each of these has a different weight. A weather forecast usually states a system of probable events, as "changing winds from the north-west or north, light clouds and a falling temperature."

Judgments of chance deal, for the most part, with contingency relations between systems of propositions. These systems are complex logical combinations of propositions. The laws of all possible combinations are the laws of chance.

There are three important phases of the relation of contingency of which we have not yet spoken: (1) favorable contingency, (2) unfavorable contingency, and (3) independence.

The following is a general illustration of these three concepts. The chances that I will be killed in war are, let us say, two to one. If my duties keep me in an *abri* thirty feet underground, this will increase the probability of my survival and decrease the probability of my death. It will be favorable to the one and unfavorable to the other. Suppose that there are no *abris* thirty feet deep, that the *abris* are as unsafe as any other place of duty. In this case the probability of my survival will be independent of whether my duty places me in an *abri*.

The distinction between antecedent and restricted probabilities must be considered in this connection. The favorable or unfavorable effect of additional conditions will always be relative to the original conditions of a probability. A condition which is favorable under one set of original circumstances might be unfavorable under another set. Independence is similarly affected by the original conditions. Thus, the probability that I would vote the Republican ticket, if I lived in Massachusetts, might be increased if the Democrats threatened the woolen industry by lowering the tariff. On a different original condition, say that I live in Georgia, the attitude of the Democratic party on the tariff might have the opposite effect on the probability of my voting the Republican ticket.

In cases of restricted probability, additional conditions are therefore *relatively* favorable to, unfavorable to, or independent of, the probability in question.

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which altered the probability could be said to be *absolutely* favorable or unfavorable. An additional condition which left the probability the same would be *absolutely* independent. Thus, for Leibniz, all worlds were *a priori* equally probable. But the goodness of this world was a condition which was absolutely favorable to it, because it increased its antecedent probability.

Summary.

The results of our examination of the concept of chance may be summarized as follows:

The definition of chance does not involve the metaphysical question of determinism. Both chance and necessity appear in the world of experience. Necessity appears when we make generalizations which hold without exception; chance appears when we make generalizations which hold in a proportion of the cases which they cover, i. e., statistical generalizations.

The statistical method is useful (1) because certain facts are such that no strict generalizations (i. e., generalizations without exceptions) can be made about them. (2) The statistical method has utility, also, as a means of dealing with large masses of things and events of which we wish to know the average or general behavior. The utility of the statistical method does not depend on human ignorance.

Judgments of chance are judgments of fact. Their subject matter is a frequency of truth within a class of propositions. Chance is therefore objective and is not created by belief. The equal distribution of ignorance, which is the basis of the Laplacian theory, is inadmissible.

Chance shows two major varieties: (1) unrestricted, and (2) restricted. Restricted chance, or probability upon certain conditions, is fundamental, and in terms of it the unrestricted or antecedent probability can be defined.

Restricted probability, or "probability upon," is a character which propositions acquire by being in the contingency relation to some other proposition or set of propositions. The contingency relation is a formal relation which subsists between propositional functions. Hence judgments of chance are like the traditional hypothetical judgments of logic: they assert a formal relation. The laws of chance show all the possible ways in which this contingency relation may be combined with the other logical relations.

It remains to set down in systematic form some of the most important propositions of the logic of chance.

Symbols:

The symbols p, q, r, s , etc., will stand for propositions.

By ' p ,' ' q ,' ' r ,' ' s ,' etc., we shall mean all true values of some propositional function $\phi x, \psi x$, etc., of which p, q, r, s , etc., are values. This must always be a finite number. The symbol ' p ' can be read elliptically "all cases of p true." (When it is written ' $p \cdot q$,' or ' $p \cdot v. q$ ' it means all true cases of the whole expression included in the single quotation marks.)

The contingency relation will be symbolized by the mark, $/$. So that p/q will mean the probability of p upon q .

Other logical relations will be symbolized by the conventional signs. Disjunction by, v ; conjunction by a dot, \cdot ; negation by, \neg .

Definition of probability.

The probability of p upon q is the ratio of all true cases of p and q to all true cases of q .

$$p/q = \frac{p \cdot q}{q}$$

Definition of relative independence.

When the probability of p upon q is equal to the probability of p upon q and r , then p is independent of r with respect to q .

$p/q = p/q \cdot r$ means p is independent of r with respect to the condition q .

The converse is true: that if p is independent of r with respect to q , r is independent of p with respect to q . The relation of independence is symmetrical. (Proved by means of the definition of probability.)

Relative favorable and unfavorable dependence.

If the probability of p upon q and r is greater than the probability of p upon q , then p is favorably contingent upon r with respect to q .

$p/q \cdot r > p/q$ means p is favorably contingent on r with respect to q .

If the probability of p upon q and r is less than the probability of p upon q , then p is unfavorably contingent upon r with respect to q .

$p/q \cdot r < p/q$ means p is unfavorably contingent upon r with respect to q .

Definition of antecedent probability.

The *antecedent probability* of p is its probability upon the condition, p , or not- p .

$p/p \cdot v \cdot \neg p$ is the antecedent probability of p .

(The condition p or not- p completely exhausts the universe of discourse: it is the widest possible condition upon which p can be probable.)

Absolute independence, and absolutely favorable and unfavorable dependence.

If the probability of p upon q is equal to the antecedent probability of p , P is absolutely independent of q . In this case, $p/p \cdot v \cdot \neg p = p/q$.

If the probability of p upon q is greater than the antecedent probability of p , then p is absolutely favorably dependent upon q . In this case, $p/q > p/p \cdot v \cdot \neg p$. If $p/q < p/p \cdot v \cdot \neg p$, then p is absolutely unfavorably dependent upon q .

Multiplication of probabilities:

The product of two independent probabilities is the probability of the joint contingency of the two propositions upon their joint conditions. This can be stated more specifically as follows:

If p/q is independent of $r \cdot s$, and r/s is independent of q , then $p/q \times r/s = p \cdot r/q \cdot s$.

Proof:

Since p/q is independent of $r \cdot s$, and r/s is independent of q , therefore $p/q = p/q \cdot r \cdot s$, and $r/s = r/s \cdot q$. (By definition of independence.)

Therefore:

$$\begin{aligned} p/q \times r/s &= p/q \cdot r \cdot s \times r/s \cdot q \\ &= \frac{p \cdot q \cdot r \cdot s}{q \cdot r \cdot s} \times \frac{r \cdot s \cdot q}{s \cdot q} && \text{(By definition} \\ &&& \text{of probability.)} \\ &= \frac{p \cdot q \cdot r \cdot s}{s \cdot q} && \text{(By cancellation.)} \\ &= p \cdot r/s \cdot q && \text{(By definition of probability.)} \end{aligned}$$

This is the most general rule for the multiplication of probabilities. Its more familiar and special form is:

The product of the probabilities of two independent propositions is the probability of their joint truth:

$p/q \times r/q = p \cdot r/q$ where p is independent of r with respect to q .

Addition of probabilities:

The sum of the probabilities of two exclusive propositions is the probability that either one or the other is true.

If the propositional functions, of which p and q are values, are mutually exclusive, then $p/q + r/q = p \cdot v. r/q$.

The proof of this proposition requires an assumption which we may call the *principle of addition*. This assumption is: If ϕx and ψx , of which p and q are values, are mutually exclusive, then ' $p \cdot v. q$ ' = ' $p \times q$ '; which means that all cases of p or q true are equivalent to all cases of p true plus all cases of q true.

The proof of the rule for adding probabilities then becomes:

$$\begin{aligned} p/q + r/q &= \frac{p \cdot q}{q} + \frac{r \cdot q}{q} && \text{(By definition} \\ &&& \text{of probability.)} \\ &= \frac{p \cdot q + r \cdot q}{q} = \frac{p \cdot q \cdot v. r \cdot q}{q} && \text{(By principle of} \\ &&& \text{addition.)} \\ &= \frac{q (p \cdot v. r)}{q} && \text{(By the distributive law of formal logic.)} \\ &= p \cdot v. r/q && \text{(By definition of probability.)} \end{aligned}$$

The rules for the addition and multiplication of probabilities are the two most important laws of chance. Multiplication, as shown above, depends upon the definition of probability and the definition of independence. Addition requires a postulate: that the sum of the true values of two exclusive propositional functions is equal to all true values of their disjunction. Addition and multiplication, together with the definitions of independence and antecedent probability, give the material for a complete logic of chance.

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RALPH M. EATON.

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"RECONSTRUCTION IN PHILOSOPHY."

This book contains a series of lectures delivered by Prof. John Dewey in the Imperial University of Japan.

As the title indicates, the aim of the lectures is to reconstruct philosophy. The development of philosophy, according to Professor Dewey, has not proceeded along correct lines. There has been bad aim and waste in effort.

The point of view from which philosophy is to be reconstructed is that of pragmatism. That is, the development of knowledge is to proceed along the lines of willing rather than of knowing. Being interested in logic, I wish to examine Professor Dewey's doctrine of logic. This is contained in Chapter VI of the book and is termed, "The Significance of Logical Reconstruction."

The teaching of the chapter is based upon the view of knowledge given in Chapter IV, "Changed Conceptions of Experience and Reason." Hence we begin with this chapter.

In this chapter Professor Dewey works out to the conclusion, "Thinking is the way in which deliberate reorganization of experience is secured." The teaching of John Locke is not correct. Knowledge does not begin in sensation. "The senses lose their place as the gateways of knowledge to take their rightful place as stimuli to action." A sensation is "urgent not cognitive in quality." "Knowledge is relegated to a derived position, secondary in origin." Prof. Dewey attributes this change of view to biology. "The effect of the development of biology has been to reverse the picture. Wherever there is life, there is behavior, activity. In order that life may persist, this activity has to be both continuous and adapted to the environment." "Wherever there is life, there is behavior, activity." That is, the ultimate is life, and life is active. "Even a clam acts upon the environment and modifies it to some extent. It does something to the environment as well as has something done to itself." I do not know what value the reader will attach to the contradiction in Professor Dewey's statement. The ultimate is life and life is activity. Yet this activity must be continuous. Not only is a must associated with this ultimate, but this must requires continuity. Continuity is not change; it is not action. It is the opposite of action. Continuity is identity that persists in and through

change. Not only must there be continuity but the activity must be "adapted to the environment." Whatever "adapted may mean, it surely cannot mean change. It is therefore interesting that Professor Dewey contradicts his doctrine in stating it. That is, Professor Dewey's explanation fails to consider the full content. The ultimate is action, yet in this ultimate action there is present that which does not act, in fact resisting all action. If the statement, "A sensation is urgent not cognitive in quality," is examined, it seems impossible to follow Professor Dewey.

Look at the figure 4, you get a clear, definite, complete percept. Examine this state of consciousness as you will, you do not detect any pull or push. The four has no connections. It is a concept in the sphere of quantity and is ultimate. It is pure. That is, it gives no evidence of dependence upon something different; nor does it produce any other. To me it is utterly without any "urge." A student once said that the four was made of apples. Two apples and two more apples would make four. The teacher accepted the challenge and ordered a barrel of apples. The task was to get a four. The class became industrious and excited. One man secured apple sauce; another got cider; another secured float. The failure to secure a four was complete.

There are sensations that excite emotions that lead to action; but many do not. An engine standing upon a beautiful road-bed with shining steel rails does not have the impulse to move. The impulse to move has its source in the boiler, not in the head-light. If we take a case of knowledge upon a higher level, say a bit of analysis by a scientist, we are unable to see the urgency. A chemist has a specimen of water. He wishes to know its structure and makes an analysis. Here is an emotion, a desire for knowledge, then the action of the analysis, then the knowledge. The action is well done, the knowledge is correct. This knowledge, water is H_2O , does not have the quality of urgency, but rather the opposite. It is a state of satisfaction, an end of action, a state of peace and rest.

Pragmatism is able to give an account of action on the level of quantity; but it fails in questions of quality. Take the case of wheat. We plant a grain and get a harvest of twenty grains. Here is a gain of nineteen grains. Pragmatism appears to offer the best explanation of these nineteen grains. There has been no change in quality. In each of the twenty grains is the identical quality. In fact if any change appears in any one of the grains, then some thing other

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than the action of the original grain is brought in as explanation. "Accidental variation" or some other meaningless phrase is invoked. The fact is, pragmatism fails at this point. The absence of change in quality is as important to pragmatism as the presence of change of quantity.

Pragmatism fails utterly on the level of finished and complete knowledge. I suppose it will be admitted that the multiplication table offers a piece of finished and perfect knowledge. We can know its life for at least three thousand years. During this period there has not been the slightest suggestion of any change of any kind. It is literally the same yesterday, to-day and forever. My mind refuses to entertain any possible change in this table. This characteristic of the table is not a peculiarity of the table. It is seen in the table because the table is an example of finished truth. Any body of knowledge has illustration of this mark of truth. In fact I do not see how it would be possible to develop a body of knowledge, if there were no fixed and dependable parts. Activity seems to belong to the unfinished, the incomplete, the young. When the truth is seen, what else is there? When a problem is solved, or a difficulty mastered, it seems impossible to act further. Change would appear in the effort to get the truth. The errors made in this effort are no part of the truth. The effort and the error cease with the knowledge. This brief sketch will show that we are unable to follow Professor Dewey in his doctrine of the place and function of knowledge. The statement is not adequate.

We now proceed to consider the doctrine in the chapter. "The Significance of Logical Reconstruction."

Professor Dewey begins his statement with a complaint as to the sad condition of logical theory. There is no agreement as to the aim, the method or the content of logic. "Logical theory presents a scene of chaos." "These contrarieties are so numerous, so extensive, and so irreconcilable that they are ludicrous." This scandalous condition is to be removed in the reconstruction submitted by Pragmatism.

It is admitted that logical theory does not present uniformity in method nor identity of content. Absolute uniformity is found in two spheres. One is the cemetery: the other is in fashion. If one wishes to establish citizenship in a cemetery, there is one thing to do. But if one wishes to be a rose, he has a choice. If one wishes to be a fish, his option ranges from a sucker to a whale. If

he wishes to be a logician, the range is still wider. Form is uniform; life is not. The richer the life, the wider the variety. Hence if logic is to deal with form, with the dead, we may expect uniformity. If it is to deal with life, we may expect exciting forms of variety. Professor Dewey says the variety amounts to chaos. I do not believe in chaos anywhere and so I take Professor Dewey as authority for abundant variety in the sphere of logical theory. This should indicate that logic, whatever it may be, is a living thing.

This brings us to the question, what is logic?

Professor Dewey says, "If thought or intelligence is the means of intentional reconstruction of experience, then logic, as an account of the procedure of thought is not purely formal." "Logic is a clarified and systematized formulation of the procedures of thinking as will enable the desired reconstruction to go more economically and efficiently. In language familiar to students, logic is both a science and an art; a science so far as it gives an organized and tested descriptive account of the way in which thought actually goes on; an art, so far as on the basis of this description it projects methods by which future thinking shall take advantage of the operations that lead to success and avoid those which result in failure."

The phrase "organized and tested descriptive account of the way in which thought actually goes on" sounds interesting. But when Professor Dewey comes to interpret his meaning, we are disappointed. "Out of this relationship of cause and effect as it is empirically ascertained grow the norms and regulations of an art of thinking." "The structure of alleged normative apriori mathematics is in truth the crowned result of ages of toilsome experience." "Logic is a matter of profound human importance precisely because it is empirically founded and experimentally applied." "Men began with counting and measuring things just as they began with pounding and burning them."

It is not fair to take a few sentences from a lecture and judge the lecture by them. Yet I think the purpose of the lecture is to show that truth has its source in action. The ultimate is not truth, but action. If this dictum of Professor Dewey stands, his purpose to clear the field of logic of variety will fail. He adds to the menagerie. It is this dictum that I wish to consider. I admit at once that truth works. It is the only thing that does work satisfactorily. That is, the man who has a clear concept of an engine

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can build one. But I am unable to find a case of pure action. Galileo discovered a law mixed in the action of the rock that fell from the tower of Pisa. Heraclitus could not state his theory of universal motion without contradicting it with his doctrine of logos. Buddhism made an effort to state an ultimate condition of change and contradicted this statement in its doctrine of Karma. The doctrine of Professor Dewey is not new. Nor does he avoid the rock upon which his predecessors floundered. "Organized and tested" do not suggest ultimate action or change. Any change would be fatal to a "Test." The process of measuring cloth can not serve as a test of the yardstick. Perhaps an illustration will clear the matter. A man wishes to grow corn. He proceeds to indulge in the process of growing corn. He plows and harrows, harrows and plows, and in due time a grain of corn is produced. My contention is that the grain of corn is apriori to the process of growing corn. The grain must precede, not follow the process of growing corn. The cultivation will affect the quantity of corn, but does not generate the corn. The sphere of pragmatism is the sphere of quantity. Action as a simple, ultimate concept is a contradiction.

With an inadequate view of sensation and a contradictory view of action, it is to be expected that the account of the beginning of thinking and the range of thinking will be unsatisfactory. Indeed, to one who loves the process of thinking and marvels at its range and power and richness, this part of the discussion is especially disappointing.

"Thinking," says Professor Dewey begins in trouble. "Men do not in their natural estate, think when they have no trouble to cope with, no difficulties to overcome." "Beings who think are beings whose life is so hemmed in and restricted that they cannot directly carry through a course of action to victorious consummation." Later in this paragraph Professor Dewey makes this admission, "Difficulties occasion thinking only when thinking is the imperative or urgent way out." That is, in an ideal condition of life there would be no thinking. It follows that the best thinking takes place in hell. Under these conditions what is an unfortunate philosopher to do? But the case is worse still. Only some difficulties are to be relieved by thinking. There is competition. "Dreams, reveries, emotional idealizations are roads which are taken to escape the strain of perplexity and doubt." To this sad estate has our American philosopher reduced thinking. It is in business with dreams, reveries,

and emotional idealizations. And we are to expect this view of thinking to reconstruct logic and lead us out into the open.

I have wondered if Professor Dewey has not confused *Verstand* and *Vernunft*? To handle a difficulty is first a matter of analysis. What is it? What is its cause? What will be the effect? These are questions of analysis and classification and involve the process of *Verstand*. The *Vernunft* is not directly involved in these. The sphere of thinking is not difficulties, but truth. Thinking has its source in the passion for truth. Difficulty is a hindrance, a limitation; thinking is a transcendence. Animals have their share of difficulties; but they do not think.

The thinker has his problems; but they are not defects of memory, or illusions of the senses, or the difficulties of faulty analysis and judgment. They are problems of thinking. That is, they arise in the development of thought. They spring out of growth, development, rather than out of misfortunes. They are solved by thinking only; never by any rhapsodical treatment. An example of what I mean is found in mathematics. When the student begins Algebra he comes upon the process of multiplying signs. Plus by plus gives plus. Minus by minus ought to give minus, but it does not. It gives plus. How? If the student will understand this, he must get busy. Where does the plus come in when you are dealing with two minus quantities? Only the one who thinks can answer this question. This is a genuine problem arising logically in the development of mathematics. If you study, these problems will arise. If you absorb them, you must think. The only way to escape the problems of intelligence, is not to be intelligent. If a student passes out of the static philosophy into the dynamic philosophy he will face the problem of the miracle. There is no escape. The problem lies in the journey. Only the intelligence that avoids all prodigal journeys escapes the problems of travel.

Then why does one think? Not to avoid a difficulty, but to express life. Thinking is positive, constructive, the full expression of life. Thinking is not the product of troubles; it is free and logical. That is, it unfolds from within. Nothing but the truth controls the thinker. No error has been able to live in the light of truth. As a boy I made an effort to see seven times eight as fifty five. When I saw it as fifty six, it was impossible to consider fifty five. The mind would not take hold. Thinking is not accident, nor the product of custom, nor the outcome of trouble,

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nor the "easiest way to do a thing." The apple tree true to itself bears apples; a thinker true to thinking is logical. And so I am sure Professor Dewey is in error when he says, "To perceive this fact is to abolish rigid dogma from the world." We may abolish the wrong use of dogma. This is being done. We may abolish the process of substituting pictures, names, hopes for dogmas. But a genuine dogma properly understood is as essential as civilization.

What then is thinking? To answer this question means a course of lectures running through a year. It is beyond the scope of a criticism of one lecture. But one may indicate the line of answer. To think is to explore variety in search of that unity we call truth. Most of our impulses are separating forces. The senses tear their facts from larger wholes. Geometry fixes these parts as final, unchanging units. A right angle triangle never changes into anything else. Grand divisions are thus introduced into life, a kind of philosophical aristocracy. Man finds himself in this disjointed, lonely world.

It is the thinker who meets and checks these disintegrating forces. The ancient Hindoo thinker saw reality as unity, one supreme unity, Brahma. He likened the process of thinking to the action of the drop of water, resting not until it is back into the bosom of the ocean. Because the drop is water it seeks its own, the ocean. So thinking, because reality is unity, seeks unity which is truth. The Upanishads give brilliant illustration of thinking. By thinking the Hindoo lifts himself out of the bonds of the physical and lives forever in the world of truth. Here we see clearly the constructive, expanding, ennobling work of thinking.

The positive, constructive work of thinking is seen perhaps more clearly in Plato and Aristotle. These added the ideal world to Greek life. It was through the work of Plato and Aristotle that the Athenian ceased to compete with Sparta and became the leader of European civilization. The marvelous careers of Alexander, Augustine, Innocent III, are possible because of Plato and Aristotle.

If you object to these illustrations as too theoretical, then reflect upon the thinking of Maxwell. This thinker considers the square root of minus one and uncovers the possibility of wireless telegraphy. Here is genuine service of most practical kind. Or take the work of Pupin studying fundamental functions and giving to the world long distance telephoning. These examples of thinking show something of the nature of thinking. It is constructive and expanding.

If you protest that these are supreme cases, I agree and reply that if you would know an apple, you would not limit your study to the bloom or the little green thing that gives boys colic. You would surely take the mature sample. If you would observe the land, ascend the highest mountain peak and feast your eyes, do not go into some hole in the valley and then say life is just bumping against environment.

The world to-day seems to be short of great leaders. I have wondered whether the philosophers were not to blame. They have been giving us such little, superficial views. There is no depth to life, no reach to vision, just environment. Let us have done with kindergarten views of the nobler qualities of man. Let us invoke the spirit of Spinoza and restate our doctrine of the Absolute One that Spinoza knew as Substance. Let us invoke the spirit of Kant and renew our faith in man, in his moral nature and obedience to the categorical imperative. And then we shall be prepared to invoke the spirit of the supreme philosopher and see reality as Spirit. Then we shall see in its fulness what it is to think.

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ON CERTAIN SUPPOSED FALLACIES OF THE CLASSICAL LOGIC.

No experience is more familiar to the mathematician than the need of extending the primitive meaning of his concepts, so as to include cases not previously suspected. Such extensions of meaning of the mathematician's assumed indefinables or of his symbols of relationship are of the greatest importance. They are only possible to the trained imagination and represent always the most serious obstacles in the learner's progress toward his goal. The mind, which has been only partly trained to follow the paths of scientific rigor, tends to fall back upon its more familiar points of view. It struggles to grasp the new, without yielding up the old conception.

If the mathematician has kept his secrets, as did his early ancestor, the Pythagorean of old, it is chiefly because these secrets

have managed to keep themselves. But the distinction between the learner and the learned is, like most distinctions, a relative one. The non-mathematical logician will follow the results which this paper presents to the point, where the demand is made that our implications shall remain true for all meanings of the terms—in particular, when any two terms have been identified. At this point an extension of the meaning of implication will be required and he will drop out of the company of our readers. The mathematical logician, being thus left to go the rest of the way alone, we shall employ the transformations of the class calculus without further explanation. Very soon, however, it will become necessary to extend the meaning of our propositional functions and some of our readers will again be lost to us. Let us hope that a few will find their way through to the end.

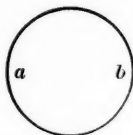
The four propositional functions, which we shall have to employ, will be abbreviated as follows. Let

- $\alpha(ab) = \text{All } a \text{ is all } b,$
- $\beta(ab) = \text{Some } a \text{ is some } b,$
- $\gamma(ab) = \text{All } a \text{ is some } b,$
- $\epsilon(ab) = \text{No } a \text{ is } b,$

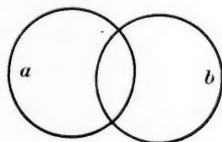
a and b standing for class-terms and the word *some* being interpreted to mean *some at least, not all*.

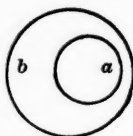
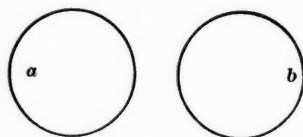
In order to attach a *preliminary* meaning to these forms, let us employ the geometrical analogy invented by Euler. Our four propositions would then be rendered by the diagrams given below.

All a is all b



Some a is some b



All a is some b No a is b 

Because they possess similar properties, it is the custom to represent *inclusion* and *implication*—just as the negation of a class and the denial of a proposition—by the same sign, i. e.,

$a \angle b = a$ is included in b ,
 $a \angle b' = a$ is included in non- b ,
 $(a \angle b)' = a$ is not included in b , etc.

Suppose that we should wish to express the propositional functions, a , β , γ and ϵ in the forms that are ordinarily employed. It would then seem natural to recognize the following identities (the multiplication sign, understood but not expressed, between the brackets, standing for the word *and*):

$$\begin{aligned} \alpha (ab) &= (a \angle b) (b \angle a), \\ \beta (ab) &= (a \angle b)' (b \angle a)' (a \angle b'), \\ \gamma (ab) &= (a \angle b) (b \angle a)', \\ \epsilon (ab) &= (a \angle b'). \end{aligned}$$

We might then inquire if these representations verify all of the implications, which the traditional logic would set down as true. In order to make this verification complete, it would be enough to deduce the characteristic inferences of the system by means of the transformations of the class calculus. Thus we should have:

$$\begin{aligned} (1) & (c \angle b) (b \angle a) \angle (c \angle a), \\ (2) & (a \angle b) (b \angle c) \angle (a \angle c). \end{aligned}$$

Multiplying together both sides of (1) and (2) and rearranging the factors conjoined in the antecedents,

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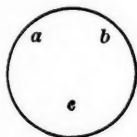
¹ For
Singer, Jr
Journal of

$$\{(b \angle a) (a \angle b)\} \{(c \angle b) (b \angle c)\} \angle \{(c \angle a) (a \angle c)\}$$

and this by definition would be the same as

$$a (ba) a (cb) \angle a (ca)$$

(see fig. below)



But it would soon be discovered that some of the implications, that would normally be recognized as valid, break down. Thus, we should expect to have

$$\gamma (ab) \epsilon (ab) \angle o,$$

(the symbol, *o*, standing for the *null*-proposition) and this would be rendered by

$$(a \angle b) (b \angle a)' (a \angle b') \angle o,$$

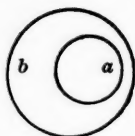
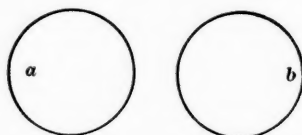
$$\text{or } (a \angle b) (a \angle b') \angle (b \angle a)$$

and this result is manifestly not true in general.

Early in the development of the class calculus fallacies similar to the one just noticed were pointed out among the implications of the common logic and it has been the habit of logicians to assert that the relationship of subalternation and some of the valid moods of the syllogism break down. This misapprehension—for it will turn out to be such—is all but universally shared by recent writers. Its removal may be effected by a solution similar to the one which follows.

Our rendering of the four propositional functions has been *over-simplified*. Let us attach to them, not the meaning which they had above and which has proven insufficient, but the one which follows, viz.,¹

¹ For the suggestion which led to this solution I am indebted to Prof. E. A. Singer, Jr. See the article, *Note on the Relation of Subalternation*, in the *Journal of Philosophy*, Sept. 11, 1919.

All a is some b No a is b 

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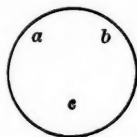
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$$\gamma (ab) \epsilon (ab) \angle o,$$

(the symbol, *o*, standing for the *null-proposition*) and this would be rendered by

$$(a \angle b) (b \angle a)' (a \angle b') \angle o,$$

$$\text{or } (a \angle b) (a \angle b') \angle (b \angle a)$$

and this result is manifestly not true in general.

Early in the development of the class calculus fallacies similar to the one just noticed were pointed out among the implications of the common logic and it has been the habit of logicians to assert that the relationship of subalternation and some of the valid moods of the syllogism break down. This misapprehension—for it will turn out to be such—is all but universally shared by recent writers. Its removal may be effected by a solution similar to the one which follows.

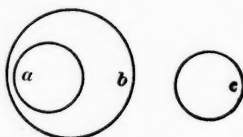
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¹ For the suggestion which led to this solution I am indebted to Prof. E. A. Singer, Jr. See the article, *Note on the Relation of Subalternation*, in the *Journal of Philosophy*, Sept. 11, 1919.

$$\begin{aligned}
 \alpha (ab) &= (a \angle b) (b \angle a), \\
 \beta (ab) &= (a \angle b)' (b \angle a)' (a \angle b')', \\
 \gamma (ab) &= (a \angle b)' (b \angle a)' (A' + B), \\
 \epsilon (ab) &= (a \angle b') A' B'.
 \end{aligned}$$

where $A = a \angle a'$ and $B = b \angle b'$.

Consider the syllogism, $\gamma (ab) \epsilon (cb) \angle \epsilon (ca)$, see fig. below)



We have

- (1) $(b \angle a)' B' A' C' \angle A' C'$,
- (2) $(a \angle b) (b \angle c') \angle (a \angle c')$

Multiplying together both sides of (1) and (2), factoring and strengthening the antecedent, and remembering that

$$(A' + B) B' C' \angle A' C',$$

there results

$$\begin{aligned}
 (a \angle b) (b \angle a)' (A' + B) (b \angle c') B' C' \angle (a \angle c) A' C', \\
 \text{or } \gamma (ab) \epsilon (cb) \angle \epsilon (ca).
 \end{aligned}$$

since

$$(b \angle c') = (c \angle b') \text{ and } (a \angle c') = (c \angle a').$$

It will be easy to see that the characteristic features of the system, which the common logic would recognize (a system whose implications might be verified empirically by the aid of Euler's diagrams), are now retained.

It must be observed, however, that the interpretation of our four propositional functions, which has just been given, is not unique. All of the implications of the same logic will hold, if the following meaning were to be assigned to the four forms.

$$\begin{aligned}
 \alpha (ab) &= (a \angle b) (b \angle a) (AB + A'B'), \\
 \beta (ab) &= (a \angle b)' (b \angle a)' \{(a \angle b')' + (A + B)\}, \\
 \gamma (ab) &= (a \angle b) \{(b \angle a)' (A' + B) + A'B\}, \\
 \epsilon (ab) &= (a \angle b') A'B'.
 \end{aligned}$$

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Let one further illustration suffice:

$$(1) A'B'C'(a \angle b)'(c \angle b)' \angle B'$$

$$(2) (b \angle a) (a \angle c') (b \angle c) \angle B$$

Multiplying together (1) and (2),

$$\begin{aligned} & (b \angle a) (a \angle c') (b \angle c) (a \angle b)'(c \angle b)' A'B'C' \angle o, \\ \text{or } & (b \angle a) \{ (a \angle b)' (A + B') + AB' \} \\ & (b \angle c) \{ (c \angle b)' (C + B') + CB' \} \\ & (a \angle c') A'C' \angle o, \end{aligned}$$

and this by definition is the same as

$$\begin{aligned} & \gamma (ba) \gamma (bc) \epsilon (ca) \angle o, \\ \text{or } & \gamma (ba) \gamma (bc) \angle \epsilon' (ca).^2 \end{aligned}$$

Our conclusion may now be briefly stated. In translating the categorical forms of the ordinary logic into the forms of inclusion of the class calculus, we must be careful that our rendering shall not be over-simplified and as a result some of the varieties of immediate inference and of the syllogism be mistakenly regarded as fallacious. A rendering of the propositional functions of the traditional logic is possible, which will allow all of the implications of that logic to remain true without any restriction whatever being imposed upon the meaning of the terms.

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² This mood of the syllogism has been selected for illustration because of its analogy with *Darapti*, a mood ordinarily regarded as fallacious (See, for example, Bertrand Russell's *Introduction to Mathematical Philosophy*, p. 164).

THE SONG OF FIRE.

I.

A monster came with lightning's loud applause
And seized upon the forests unafraid,
Devouring them with laughing unseen jaws
And breathing fiery smoky breath which laid
Its blackened mark on everything it swayed
Or touched. And infant Man beheld in fear
The beast which came from angry gods severe.
He fled in pain before its unseen blade
And licked the wound which it so strangely made.
He crouched to see the thunder-storm appear.
He fled the mountains whence such monsters rise
In power for mad destruction's wild career.
What memory a dawning mind supplies
But makes more strong this fear which terrifies.

II.

In time Man's wish for knowledge overpowered
The awe and dread which held his soul enchained
In terror's pain before the flame which towered
Above or swept along the forest stained;
Its sense of play in time his heart regained.
He added fuel to the fire for fun!
And began a lesson which is not yet done.
He found the softening comfort fire maintained;
What once was terror he to joy constrained.
No beast has ever found this skill. Not one
Has learned to keep a fire. But Man withdrew
Its fangs and taught it to his work to run.
By aid of fire Man spread to regions new,
Foretelling he the earth should yet subdue.

III.

With mastery of zealous fire began
Controls of nature's varied powers which raise

Our hopes and prophesy the growth of Man.
'Tis put to use in many thousand ways ;
Its power lightens work of busy days.
It brings to view what nature never made,
Now wrested from her by the hand which laid
With skill the power of fire upon her maze,
Demanding truth of Nature who obeys.
Whatever law is found or truth portrayed
But calls for other mastery and higher ;
To spiral heights we climb by conquest's aid.
As Man still grows so grows the use of fire
To meet his wish and rally his desire.

IV.

The first fireplace kept up by thoughtful Man
A meeting place for many friends became.
The memories which clustered there began
To draw together strength and human aim,
And Man with zeal and purpose new inflame.
They knit together forces which entwined
The cords of love round hearts of humankind.
They brought the common goods to wide acclaim,
And Man learned how his ruder strength to tame.
Henceforth a place to Man shall be assigned
As one whose wondrous labors far excel
Whate'er can come, by one alone designed ;
And fire shall mix with all that Man shall tell
Of things in earth or things in heaven or hell.

V.

Know you that life which proudly moves in you
And fire which lives and glows are one, with the same
Glad power and sources whence that power they drew ?
That breath of life is but the breath of flame ?
That this the spirit's power doth proclaim ?
And Man is but a fire now hid in clay
Which yet again shall flame some happy day
When genius brings, to justify its fame,
A novel conquest Man shall joy to acclaim ?
Could Man be Man without the fire's assay,

The fire of genial spirit to aspire,
The fire of truth to melt his dross away?
Could Man be Man without the use of fire
Which wildly burns with flaming wild desire?

VI.

When a tribe outgrew its central fire or ranged
Too widely o'er the fields to well command
The benefits which grew from thoughts exchanged
Around the fire, those leaving took a brand
And made with it a fire in their new land.
Without intending it, they took away,
Besides the fire they purposed to convey,
A part of all the best the tribe had planned
And those still greater goods none understand,
Spontaneous truth which grows without display
And the spirit binding soul to kindred soul.
The kinship early felt still holds its sway;
The truth and life which early rose control
The unitary progress of the whole.

VII.

When a man and woman went to live apart
Their family grew around their genial fire,
And thus were bound their children heart to heart.
Here first they learned for wisdom to inquire.
Here first glad nature taught them to aspire.
Here grew the strongest tie that Man has known,
The sacred tie which binds him to his own.
Should family fire on unkept hearth expire
A fatal famine comes and danger dire.
The household sun which ages long has shone
Must light the life of all the family race,
Transmitting what of good in it has grown.
Ancestral spirits dwell in the loved hearth-place;
Their life with childhood's growth they interlace.

VIII.

Around the central hearthstone clustered life's
Intenser joys, and Man lived here erect

In presence of himself, apart from strifes.
Whatever worth life taught him to expect
In character its strength did here project.
The silent hour before the ember's glow
Brought aspiration's zeal to overflow.
Whatever wish his purpose might reflect
Here wrought with power upon his intellect.
His brooding spirit, but short time ago
Submerged beneath the action of the day,
Now found its opportunity to grow.
In silent thought his inner life could sway
His deeper self through powers which came to stay.

IX.

Not always pleasant was his fireside thought.
An ominous accuser sometimes came.
The pain his actions gave to others brought
A pain to him; he felt a sense of shame;
He felt a power his wickedness proclaim.
Incipient sense of right and wrong found way;
A deeper force Man felt himself obey.
The fire of conscience burned with flickering flame.
Which hearth-fires lighted, crescent Man to tame.
And so the body's cast of humble clay
Was animated by a flame of fire
Whose penetrating beam foretold the day
When Man to righteous conduct should aspire.
And Nature reach in him her best desire.

R. D. CARMICHAEL.

URBANA, ILL.

THE FADING FAITH.

Two forces, one concrete and visible,
 And one articulate, but not attained
 Full girth, circle the wreck of justice feigned,
 With never seer or prophet to foretell
 Their orbits. Not a sentinel's "All's well"
 Assures an earthly Paradise regained,
 With peace restored and savagery rechained,
 To ward from earth another Dante's hell.
 Snarling the nations part, each with its bone,
 Licking their wounds, defeated all, not shamed
 By deeds that sound the very depths of shame.
 The masses wake. The seeds of thought wide sown
 Now ripen to unfold what all disclaimed.
 A greater Samson shakes the temple's frame.

This France, intent on spoil of land and gold,
 Is this her voice, in danger well concealed,
 Now shrill and loud in clamorous peace revealed!
 Or cries again the cruel France of old,
 Rapacious, predatory France, whose hold
 Laid waste the Rhine land, home and fertile field,
 Castle and peasant's patch, whose ominous shield
 Was stained with slaughter and crimes manifold!
 The star of empire changed its course to save
 No furies.—France! Is this the whole of France
 Or but a part, the worst! Humanity
 Reverted to base aims! An opened grave
 Where breed miasmas foul, where false lights dance,
 While fades the faith that men may yet be free!

Once more has fortune come to England's aid
 At direst need. Storm wrecked the Spaniard's fleet;
 The Prussian clinched Napoleon's defeat;
 The Boer struck the hour; the German stayed

His hand at rest upon the battle-blade ;
 Back from the Rhine the Dutch helped England beat
 Ambitious France ; the victory complete
 France turned to English ports the Dutchman's trade.
 How fares an earth late shaped to England's ends !
 Ally and foe, her rivals twain, both fall,
 The German and the Russ. The gathered greed
 Of all time past the outcome crowns, and sends
 A mime to gloat at a great funeral,
 While half the world wears black and still shall bleed.

The constellations dimmed, one fixed star gleamed.
 A true Polaris of the four year night.
 Westward a menace lurked ; Eastward a might,
 So vast that it invulnerable seemed,
 Loomed over Holland. There had Grotius dreamed
 Of open seas and law upholding right.
 A greater power than sea force shall indict
 Not one, but each land where outlawry teemed.
 Loudon ! Wise helmsman of a little state
 While mighty states are ruled by lesser men.
 May Nederland forgive ! Can she forget
 That when her hands heaped high the outstretched plate
 To Belgian refugees, her bread, if hoarded then,
 Had saved her own when we drew tight the net ?

For every exile shelter, food and care ;
 For every home a Belgian refugee,
 Flaunting aloft no flag of sanctity,
 Filled at low graneries too soon made bare,
 The Dutch ship sped to Belgium in despair,
 Granting what England had refused, the plea
 America had sent across the sea.
 For facing want the Dutchman still could share.
 Time has no record of a charity
 So vast, so meanly met. Those refugees—
 A million—clothed and housed, made warm and fed—
 If never rivals, had been foes. No alchemy
 Of state could change in one the manganese
 Into the other's gold, or keep them wed.

Like boisterous winds that whirl about the door,
 But leave the ashes on the hearth unstirred,
 The voices our America has heard,
 Press, pulpit, and time serving orator
 Have pared the truth, but not revealed the core,
 On course and end pronounced no marriage word,
 But shunned the backward look, by fear deferred,
 Lest to reflect would be but to deplore.
 Time will at last assort the false and true,
 Assay the hosts fed on forbidden fruit,
 The salvage sift for aught of any worth,
 And measure out to all what is their due.
 Sires may be silent: sons will not be mute
 In scorn when they look back on wisdom's dearth.

ISAAC RUSLING PENNYPACKER.

ARDMORE, PENN.

IMMORTALITY AND MONADISTIC IDEALISM.

To reply to the interesting criticisms of my views which Mr. Tsanoff published in the April number of *The Monist* would, I fear, take too long. I will content myself with mentioning two points in which, as it seems to me, he has mistaken what my views are.

He says, "it is presumably taken for granted by Dr. McTaggart that a self's character does not admit of its being involved in such intimate communion with more than one person." I do not take this for granted, because I do not accept it at all. It is possible—for it is often cited—that A should love both B and C, even *sub specie temporis* and at the same time. A fortiori, it seems to me, would this be possible *sub specie æternitatis*.

Again, he quotes my remark: "it does not follow, because a self which has a body cannot get its data except in connection with that body, that it would be possible for a self without a body to get data in some other way." Then he adds the following (the italics are mine): "*That is to say*, it does not follow, because a conscious self

requires sufficient data for its mental activity, that a non-conscious self need be similarly limited." I am at a loss to conceive how Mr. Tsanoff can have interpreted my sentence in this way. I did not speak of an unconscious self at all, nor of any self which had not sufficient data for its mental activity. What I maintained was that, while a conscious self with a body could not get sufficient data without the help of that body, it was possible that a conscious self without a body could get sufficient data in some way which did not require the help of a body.

J. ELLIS McTAGGART.

CAMBRIDGE, ENGLAND.

BOOK REVIEWS AND NOTES.

PSYCHOLOGY AND FOLK-LORE. By *R. R. Marett, M.A., D.Sc.* London, Methuen and Co. Pp. x, 275. Price, 7s. 6d. net.

In this book the author (who is the University Reader in Social Anthropology at Oxford) has brought together a number of addresses, essays and reviews dealing with his special subject. Dr. Marrett, following what he regards as the fundamental method of his science, attempts sympathetically to insinuate himself into the attitude of mind of the unlettered peasant as a means of understanding the mental processes of more primitive people. Thus he is interested in ancient customs and beliefs not as museum specimens but as vital expressions of tendencies which civilization has submerged rather than completely destroyed. "Hence," he says, "given conditions unfavorable to the predominance of the scientific temper, the lurking superstition will out; so that the magic-haunted fantasy of aboriginal Australia comes to life again in the witch-mania of a Europe which, paradoxically enough, is in the throes of an intellectual and spiritual re-birth." So fertility charms are still on sale in the East End of London, while in the West End a *séance* with a Witch of Endor is doubtless to be obtained for a suitable fee. This point of view which is arrived at through a thorough intimacy with modern psychology and its methods enables Mr. Marrett to see something like unity in the sphere where his predecessors were wont to find confusion. This suggestive book will raise many expectations which Dr. Marrett will find it no doubt an interesting task to satisfy.

FRANK WATTS.

A SHORT HISTORY OF EDUCATION. By *John William Adamson.* Cambridge University Press; New York: G. P. Putnam's Sons. 1919. Pp. xi, 371. Price, 12s. 6d. net.

This book contains a most convenient and readable summary of the history of Education in England; for it does not (as its title would suggest) deal, except incidentally, with that of other countries. Professor Adamson writes mostly of

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institutions—schools and colleges—and the work done in them, since he holds that “the history of education is not coincident, point for point, with the history of opinions concerning what education ought to be.” For the earlier centuries the history is admittedly (and at present almost necessarily) based on the researches of the late A. F. Leach; though Professor Adamson does not follow all the deductions which that writer was wont so truculently to preach. There is, however, a useful chapter on the education of chivalry, which trained the many who were not of the scholarly type. But on the whole the account of medieval education is the least satisfactory section; the truth indeed being that far more research is necessary before that history can be adequately written. The account of Humanism, of the New Philosophy and its educational developments (in which, as might be expected from Professor Adamson, Ratke is not even mentioned), and of the eighteenth century, are all excellent. The drab story of the nineteenth century is told as lucidly as may be; though it seems a pity that the continuation of that story should end at 1903. The value and interest of the book are increased by contemporary descriptions of education in various centuries, e. g., those of John of Salisbury and John Wallis, and of works of traditional importance, such as the *Doctrinale* of Alexander de Villa Dei. Altogether it is the soundest text-book on its subject that has yet appeared.

F. A. CAVENAGH.

A HISTORY OF THE CONCEPTIONS OF LIMITS AND FLUXIONS IN GREAT BRITAIN FROM NEWTON TO WOODHOUSE. By *Florian Cajori*. London: The Open Court Publishing Co., 1919. Pp. 293 + vii contents + 6 index. Price, 7s. 6d.

Everybody who is interested in the fundamentals of the Calculus should read this ably written little book. Starting with the works of Newton that contain mention of fluxions, we are led, through a chapter on printed books and articles on the subject which were published before 1734, to the controversy between Berkeley on the one side and Jurin and Walton on the other. Then we have the controversy, Robins and Pemberton versus Jurin, which really produced valuable results; these, leading immediately to several texts on fluxions, ultimately caused the production of Maclaurin's Treatise of 1742. We are then given a bibliography of books published between 1745 and 1761, with extracts and short discussions; of these Professor Cajori remarks that only two were of any real interest, namely, those of Simpson and Emerson. These two works lead to a controversy between Robert Heath and others as partizans of Emerson and John Turner and others as partizans of Simpson; this controversy had little to commend it. The final chapters deal with abortive attempts at arithmetization, later books and articles on fluxions, and criticisms by British writers; a summary of the whole by the author, under the chapter-heading “Merits and Defects,” closes a most interesting volume.

There is but one matter for adverse comment: this occurs on page 36, where Professor Cajori founds an argument on the occurrence of the words “at the very *instant*,” taken from the translation by Thorp of the Latin of

Newton, without noticing that here is nothing of the sort in the Latin, which is given on page 6. It is Thorp's idea that is thus criticized and not Newton's; for Newton's words are, "*sed tunc cum attingit*," which should have been translated by some such logical phrase as, "but at the *then* when it reaches (this position)." Thus, no matter what the manner may be in which Newton made use of fluxions, he originally defined a fluxion by a *Schnitt*, without infinitesimals.

J. M. CHILD.